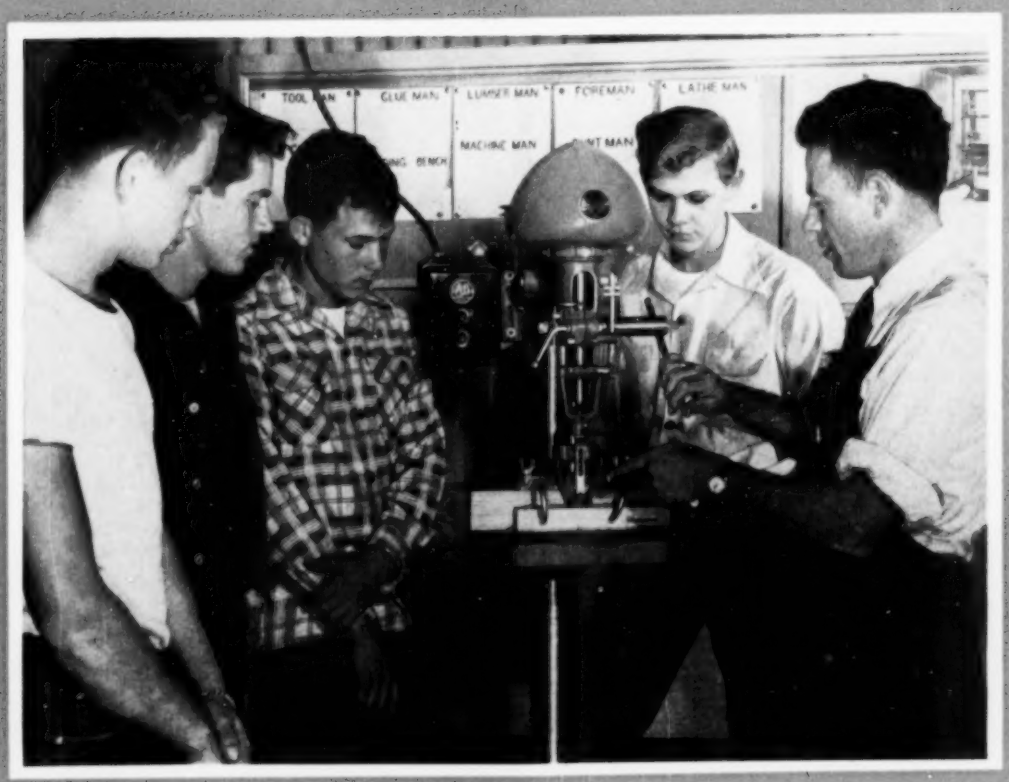
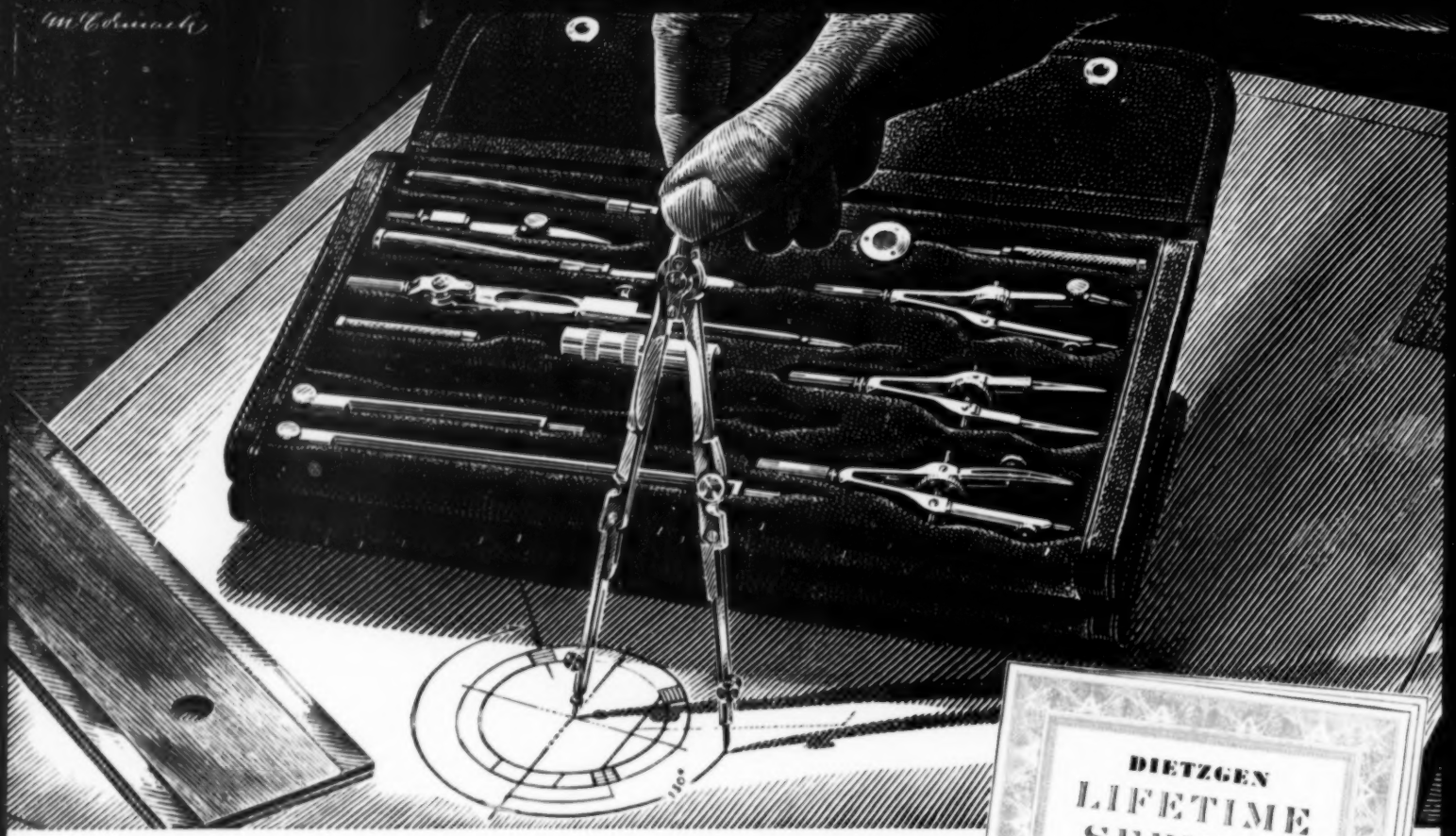
FEBRUARY, 1954 Vol. 43, No. 2

Industrial Arts and Vocational Education

1914 40th Anniversary Year 1954

THE SHOP TEACHERS' PROFESSIONAL MAGAZINE





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Dietzgen standardization of drawing instrument designs and the Dietzgen Lifetime Replacement and Repair Parts Policy are valued highly for the convenience and savings they assure both individual owners and volume users (educational institutions, trade schools, etc.) of Dietzgen Drawing Instruments. Lost or damaged parts can be replaced with perfectly fitting Dietzgen Repair and Replacement Parts made from the same tools and with the same skill that produced the original parts. Your Dietzgen dealer or the nearest Dietzgen branch is ready to serve you. Institutions may obtain Dietzgen Repair Parts Kits containing the parts most frequently required for servicing a quantity of sets of the same grade.
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These men know there is little economy to be gained by the purchase of a "cheap" set whose value is less to begin with and whose usefulness is hurt or destroyed when a lost instrument cannot be replaced or a damaged part repaired. They know the resale value of such an orphan set can be but small.

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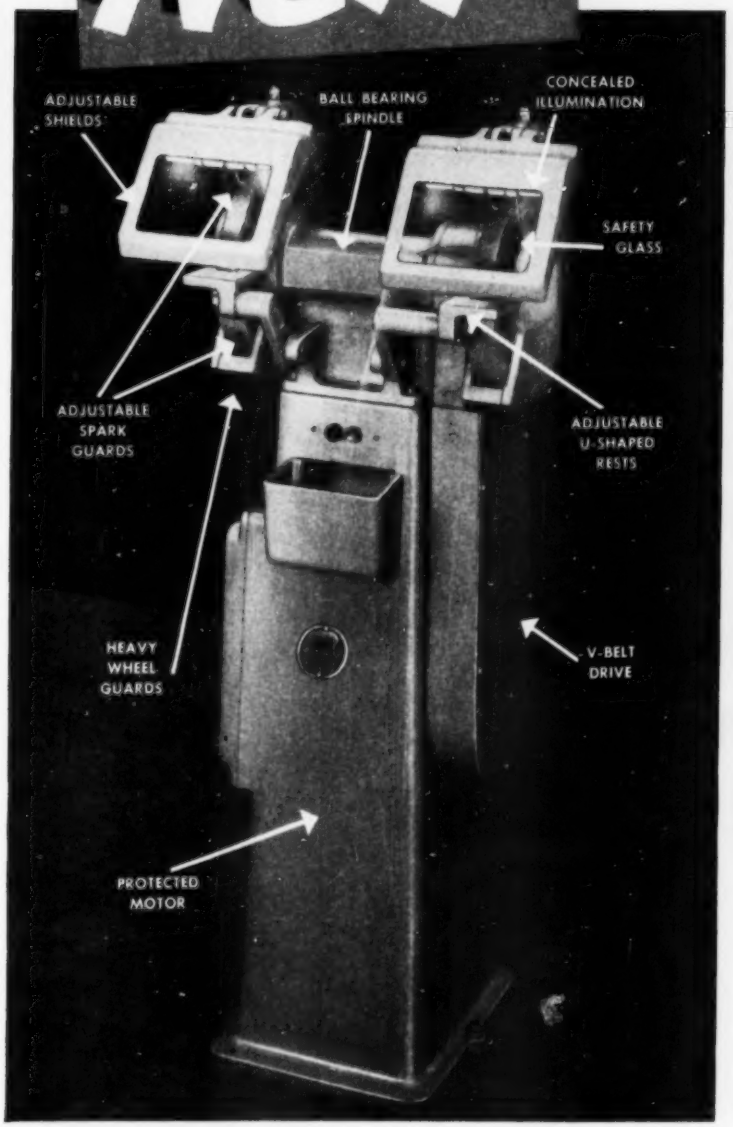

School shops will find this new industrial grinder ideal for student use. It is ruggedly built throughout to withstand hard service. The motor is enclosed in the pedestal and drives through a V-belt which removes the load and weight of the grinding wheels from the motor bearings, practically eliminates vibration and isolates the motor from abrasive dust.

Send coupon for complete information on this grinder that will give you long, trouble-free service.

SPECIFICATIONS

Wheel Size: 8" dia. (½ h.p. motor), 10" dia. (¾ h.p. motor).

Spindle: Approximate speed 2450 r.p.m. Sealed ball bearings.

Motor: Standard 2875 r.p.m. 50 cycle or 3450 r.p.m. 60 cycle, also D.C.

Over-all Dimensions: 8" Grinder, 49½" high, 18" wide, 20½" deep. 10" Grinder, 49½" high, 18½" wide, 20½" deep.

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2. Order by mail from your distributor.
3. If no distributor is nearby, order direct from factory.

South Bend machine tools with accessories may be purchased on convenient terms up to 12 months.

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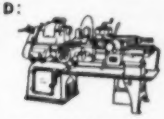
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☐ 7" BENCH SHAPERS

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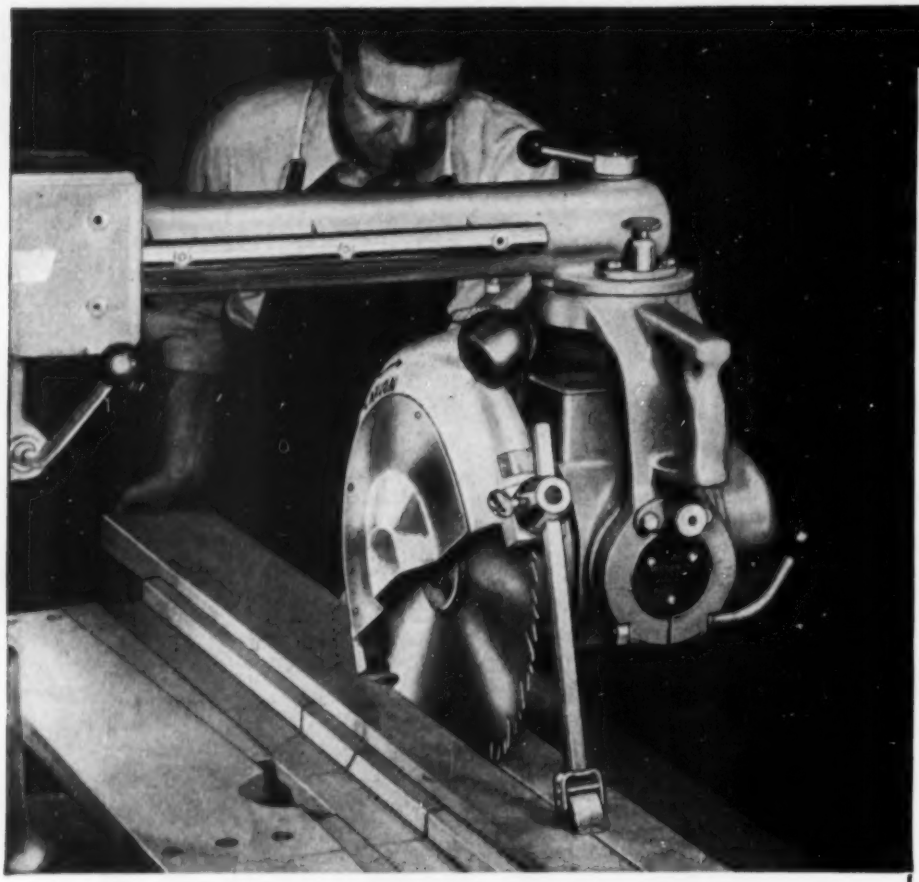
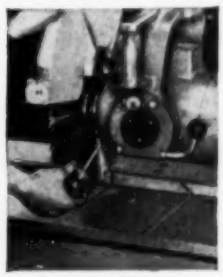


SKIL "Retracto-Glide" arm lets students stand right up to work . . . no ducking around fixed over-arm.

All the bevel, miter and compound cuts are set up and made easily on the SKIL Radial Saw.



One-piece safety saw guard protects student operator at all times. Remove or replace in seconds without tools. No loose parts to lose in sawdust.

Patented contour-grip handle is comfortable for long use. Arm "glides," reducing fatigue—allows student to concentrate on what he is learning.

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Students who use SKIL Radial Saws learn faster and easier! With the "Retracto-Glide" arm, they can stand right at the center of the work table. See layout marks without bending and stooping. All controls can easily be reached from the front. This means much better work with maximum safety.

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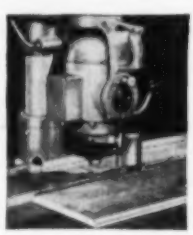

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FEBRUARY
1954

VOL. 43 NO. 2

INDUSTRIAL ARTS and VOCATIONAL EDUCATION

The Shop Teachers' Professional Magazine

Published on the 15th of the month preceding the date of issue by **THE BRUCE PUBLISHING COMPANY**, 400 North Broadway, Milwaukee 1, Wisconsin • **CENTRAL OFFICE**: 20 North Wacker Drive, Chicago 6, Illinois • **EASTERN OFFICE**: 225 Broadway, New York 7, New York.

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This Month's Cover

The picture on the cover of the February, 1954, issue of INDUSTRIAL ARTS AND VOCATIONAL EDUCATION shows Mr. Sam Sherril giving a demonstration to a few elementary woodworking students on how to cut a mortise on a mortising machine, at the Tucson Senior High School, Tucson, Arizona.

Harry A. Goldstein, instructor of photography at the high school, submitted the photograph.

* * * * *

Entered January 2, 1914, as Second-Class Mail Matter at Milwaukee, Wis., under Act of March 3, 1879. Copyright, 1954, by the Bruce Publishing Co. Title registered as Trade Mark in U. S. Patent Office, November 25, 1930. Published monthly except during July and August.

Subscription Information. — Subscription price in the United States, U.S. possessions, and Canada, $3.00 a year, payable in advance. In all foreign countries, $3.75. Copies not more than three months old, 35 cents; more than three months old, 50 cents.

Discontinuance. — Notice of discontinuance of subscription must reach the Publication Office in Milwaukee, at least fifteen days before date of expiration. Notices of changes of address should invariably include the old as well as the new address. Complaints of nonreceipt of subscribers' copies cannot be honored unless made within fifteen days after date of issue.

Editorial Contributions. — The Editor invites contributions bearing upon Industrial Arts, Vocational Education, and related subjects. Manuscripts, drawings, projects, news, etc., should be sent to the Publication Office in Milwaukee. Contributions are paid for upon publication. In all cases manuscripts should be accompanied by full return postage.

Articles Indexed. — The articles contained in the Magazine are regularly indexed in "The Readers' Guide to Periodical Literature," and "Education Index."

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ASSOCIATION NEWS

THE AMERICAN INDUSTRIAL ARTS CONVENTION

March 22 to 27, 1954, will be a week full of the finest industrial-arts educational experiences for those attending the American Industrial Arts Association Los Angeles convention.

For those fortunate enough to be in Los Angeles Monday, March 22, the School Visitation Committee has arranged a full day to show how it is done in California. A series of industrial tours also are arranged.

The American Council on Industrial Arts Teacher Education, and The American Council of Industrial Arts Supervisors will hold general and group meetings throughout Tuesday and Wednesday morning.

The first general meeting of AIAA will be held Wednesday afternoon. Dr. John R. Ludington, specialist for industrial arts in the U. S. Office of Education, will be the opening speaker. His topic will be "What Developments in the Next Ten Years Will Change the Conditions Under Which Industrial Arts Works?" The second and concluding address of the afternoon will be presented by Dr. R. Lee Hornbake, professor of industrial arts, University of Maryland, who is serving as co-ordinator for the five discussion groups which will meet Wednesday evening and all day Thursday.

The topics for the Discussion Groups are:

1. "What Are the Improved Curriculum Development Procedures in Industrial Arts Applicable at the Local Level?"
2. "How Can the Industrial Arts Profession Improve the Development, Selection, and Use of Instructional Materials?"
3. "What Are Improved Patterns of In-Service Education Programs for Industrial-Arts teachers?"
4. "What Teaching Methods Are Appropriate to Industrial Arts Instruction and How Do They Apply to Pupils of Diverse Capacities?"
5. "What Can Voluntary Industrial Arts Groups Do to Improve State, District, and Local Programs?"

During the time the discussion groups are in session, there will be parallel meetings dealing with educational housing; the role of industrial arts in out-of-school educational programs; how the industrial-arts profession can develop better understanding of business, industry, and labor; exploring and developing pupil interests and abilities.

Professor Lynne Monroe, University of California, is guiding a Friday morning program for and by industrial-arts student teachers. What a real professional experience for these students who represent colleges from distant points!

Friday morning will be devoted to a program on elementary school industrial arts. Dr. Mary Margaret Scobey, Syracuse University, is developing this program.

On Friday afternoon, the master teachers of the West Coast will take over the massive ballroom to conduct a live demonstration of why and how to do it. This Industrial Arts Fair is under the direction of J. Lyman Goldsmith and Dr. Kermit Seefeld, the co-chairmen for the convention.

The annual banquet and Ship's Party on Friday evening is bound to be another of the many gala events.

No mention has been made of the commercial exhibit, which is expected to be the largest in the history of AIAA; the instructional aids display, the California weather, hospitality, etc.

Saturday has been designated as Santa Barbara Day, with an Epsilon Pi Tau initiation ceremony to be held at the University of California there. Tours of the industrial-arts department of the college and points of interest in the city have been planned.

BALL STATE TEACHERS COLLEGE INDUSTRIAL ARTS CONFERENCE

The Ball State Teachers College Industrial Arts Department, Muncie, Ind., is having a spring industrial-arts conference for teachers and students of Indiana on Friday, February 26, 1954. Dewey F. Barich, manager, Ford Motor Company Industrial Arts Awards, will be the main speaker. Sectional meetings and shop demonstrations will follow the morning general meeting.

Willard A. Allen and Charles F. Shoemaker are the cochairmen of this conference.

IOTA LAMBDA SIGMA FRATERNITY ELECT NATIONAL OFFICERS

National Officers of Iota Lambda Sigma, professional fraternity in Industrial Education, elected at the annual meeting of the Grand Chapter in Chicago, Ill., November 25, are president, W. L. Newton, director of vocational education, Meridian, Miss.; vice-president, Ammon Swope, professor of industrial education, Purdue University, Lafayette, Ind.; secretary-treasurer, Clyde H. Wilson, professor of industrial education, University of Tennessee, Knoxville, Tenn. (re-elected); historian, Leonard R. Booker, teacher trainer, industrial education,

(Continued on page 6A)

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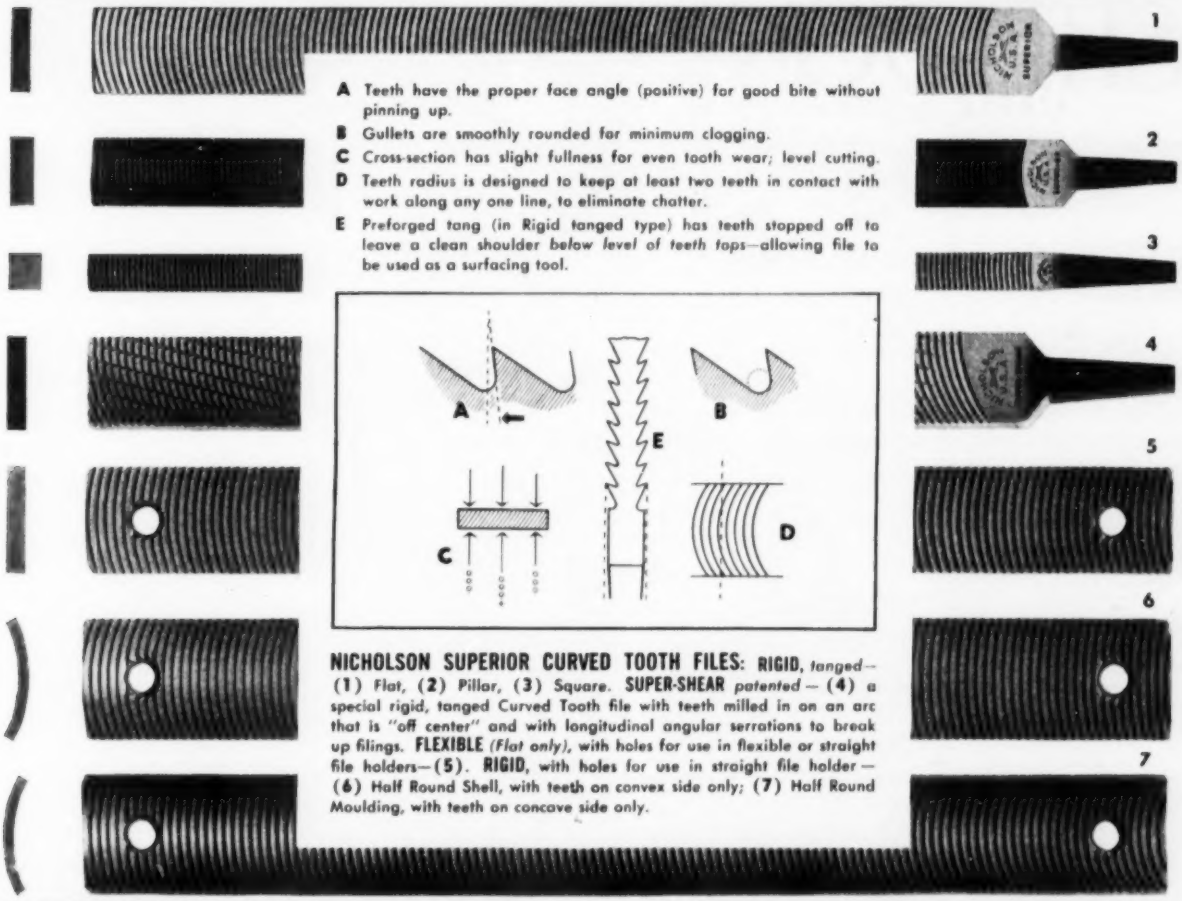

A Teeth have the proper face angle (positive) for good bite without pinning up.

B Gullets are smoothly rounded for minimum clogging.

C Cross-section has slight fullness for even tooth wear; level cutting.

D Teeth radius is designed to keep at least two teeth in contact with work along any one line, to eliminate chatter.

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SUPERIOR in both name and fact is the confident claim made for these precision-milled Curved Tooth files. Note, above, the seemingly little things which jointly constitute a BIG thing in support of that claim. They are some of the visible evidences of matchlessly high quality and efficiency. But what you don't see are the thought, processes and care that go into their manufacture, such as:

Steels are studied, specified, analyzed for best tooth-cutting qualities and longest serviceable life. . . . Designs, embodying exclusive Nicholson features, are minutely worked out. . . . Teeth are milled in with specially designed machines, producing "razor-sharp" edges. . . . Hardening is conducted with meticulous care and uniformity. . . . Every step of manufacture is under rigid control and inspection. . . . There is no finer brand of Curved Tooth files under the sun.

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ASSOCIATION NEWS

(Continued from page 4A)

Clemson College, Clemson, S. C. (re-elected).

Officers of the National Advisory Council for the ensuing year are: chairman, Walter M. Arnold, state supervisor of trade and industrial education, Stillwater, Okla.; vice-chairman, Earl M. Bowler, department of industrial education, University of Texas, Austin, Tex.

Representatives were present from 18 of the 20 chapters of the fraternity and a total of 269 initiates was reported for the year 1952–53. Approval was voted for a new chapter at New Mexico Western College, Silver City, N. Mex.

EPSILON PI TAU INITIATION

At the recent initiation of the Alpha-Rho Chapter of Epsilon Pi Tau, New York University School of Education, 17 new members were received into the chapter.

The initiates are: Carlton E. Bauer, Marion B. Schuetz, Frank Hausman, James H. Muff, Desire Kauffmann, John M. Fontana, Herman R. Buros, Gerald J. Mallon, Robert S. Seckendorf, Irving I. Zimbalist, Peter D. Boggia, Edmund J. Gannon, Edwin D. Miller, Edwin W. Thurber, Charles A. Stegemann, Raymond S. Christian, and Andre J. Jolicoeur.

Maximillian Komow presented the laureate key to Edmund J. Gannon.

Alpha-Rho Chapter was formed only two years ago in 1951, and is growing fast since N.Y.U. has a large industrial-arts department in its school of education. — *Robert Benson, secretary.*

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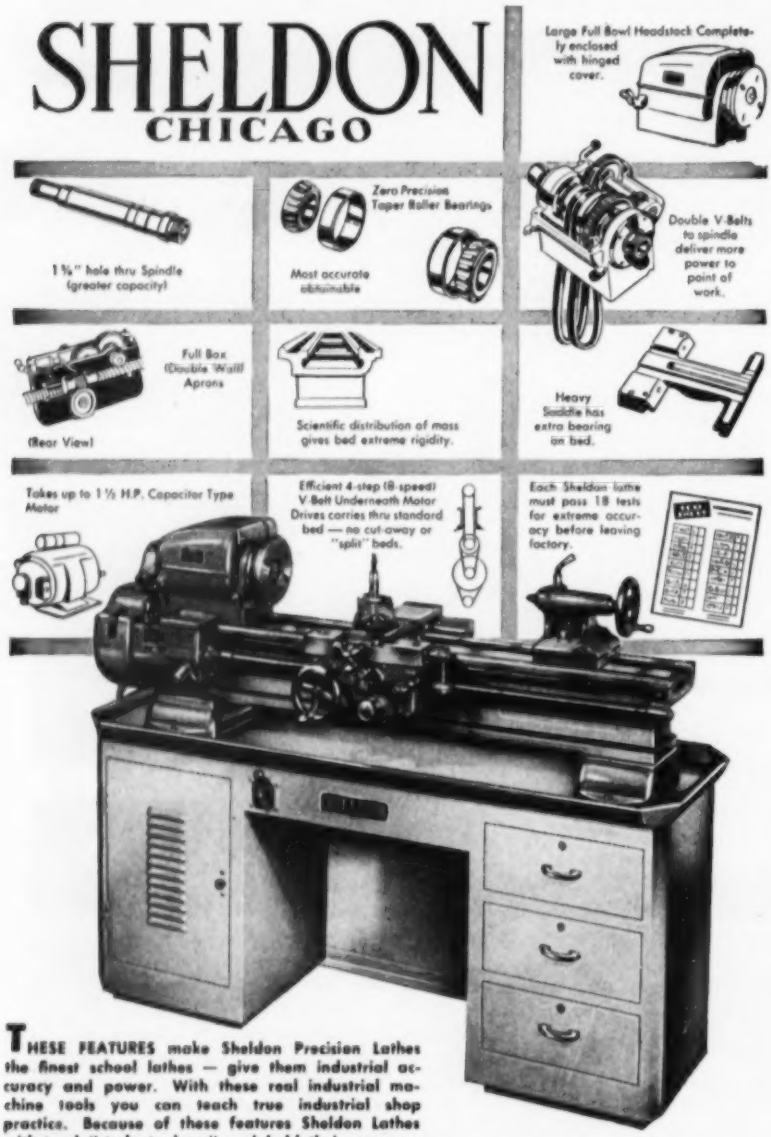
Large Full Bowl Headstock Completely enclosed with hinged cover.
1 ¾" hole thru Spindle (greater capacity)
Zero Precision Taper Roller Bearings
Most accurate obtainable
Double V-Belts to spindle deliver more power to point of work.
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(Rear View)
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Heavy Saddle has extra bearing on bed.
Takes up to 1 ½ H.P. Capacitor Type Motor
Efficient 4-step (8-speed) V-Belt Underneath Motor Drives carries thru standard bed — no cut-away or "split" beds.
Each Sheldon lathe must pass 18 tests for extreme accuracy before leaving factory.

THESE FEATURES make Sheldon Precision Lathes the finest school lathes — give them industrial accuracy and power. With these real industrial machine tools you can teach true industrial shop practice. Because of these features Sheldon Lathes withstand "student abuse" and hold their accuracy without constant bearing maintenance. With fully enclosed headstocks and available with lever-operated speed-changes. They are safe for students to operate.

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NORTH CAROLINA INDUSTRIAL ARTS ASSOCIATION MEETING

The North Carolina Industrial Arts Association held its fifth annual fall meeting in the industrial-arts department of the Asheboro High School on November 14.

The meeting began with demonstrations of projects turned on the lathes, finishing, etc., by high school students. Seventy industrial-arts teachers and professors from North Carolina schools and colleges were present.

Nile Hunt, co-ordinator of education of the State Board of Education, told the group it is the duty of the present teachers to get their best students to become teachers in the future.

Officers of the association are: president, Frank Briley of Raleigh; vice-president, Tom J. Haigwood, Charlotte Tech; secretary-treasurer, Dr. Marshall L. Schmitt; and public relation chairman, K. C. Sinclair, Charlotte Central. Past president is Claude Bell, Charlotte Central.

INDUSTRIAL ARTS AT THE P.S.E.A. CONVENTION

The industrial-arts section of the practical arts and vocational education department of the Pennsylvania State Education Association met on December 29 in Harrisburg, Pa.

The main speaker at the industrial-arts meeting was Dr. Allen H. Wetter, associate superintendent of schools, Philadelphia, Pa. His subject was "Good Public Relations."

A *project fair* followed where those who attended could discuss the projects made by some of their fellow teachers.

Of course, the take home plans were a valuable addition to the "telling."

A short business meeting followed the program.

MINNESOTA INDUSTRIAL ARTS CONVENTION

The Minnesota Industrial Arts Association held a most successful convention on October 29 and 30 at Minneapolis, Minn.

The new officers for the next year are: president, Douglas B. Sowle, Montevideo, Minn.; vice-president, Karl Ruthenbeck, Virginia, Minn.; secretary-treasurer, Ray Zakariasen, St. Louis Park, Minn.; convention chairman, Ray Doane, Room 515 City Hall, St. Paul, Minn.

♦ On Saturday, January 9, the University of California held a junior college conference with the view of helping student counselors and other faculty members to deal effectively with problems incident to industrial arts and technological education. Junior college counselors were therefore invited to attend this conference to acquire the positive information about industrial-arts curricula leading to teaching credentials and industrial opportunities in the West.

Dr. J. Lyman Goldsmith, directing supervisor, agricultural, vocational, industrial arts education, Los Angeles City Schools, spoke on "Opportunities in Industrial Arts Teaching," and H. H. Eaves, executive vice-president, director of research, Penta Laboratories, Santa Barbara, discussed "The Opportunities in Industrial Arts — Industry."

Luncheon was served in the Mesa Campus Quadrangle, and after a tour of the industrial-arts building, Dr. Adam Diehl, dean, curriculum services, Los Angeles City College, spoke on "The Junior College Curriculum in Industrial Arts," and Dr. Lynne C. Monroe, professor of industrial arts, Santa Barbara College, chose for his subject the "University of California Industrial-Arts Curricula."

♦ The North Carolina Industrial Arts Associa-

(Continued on page 8A)

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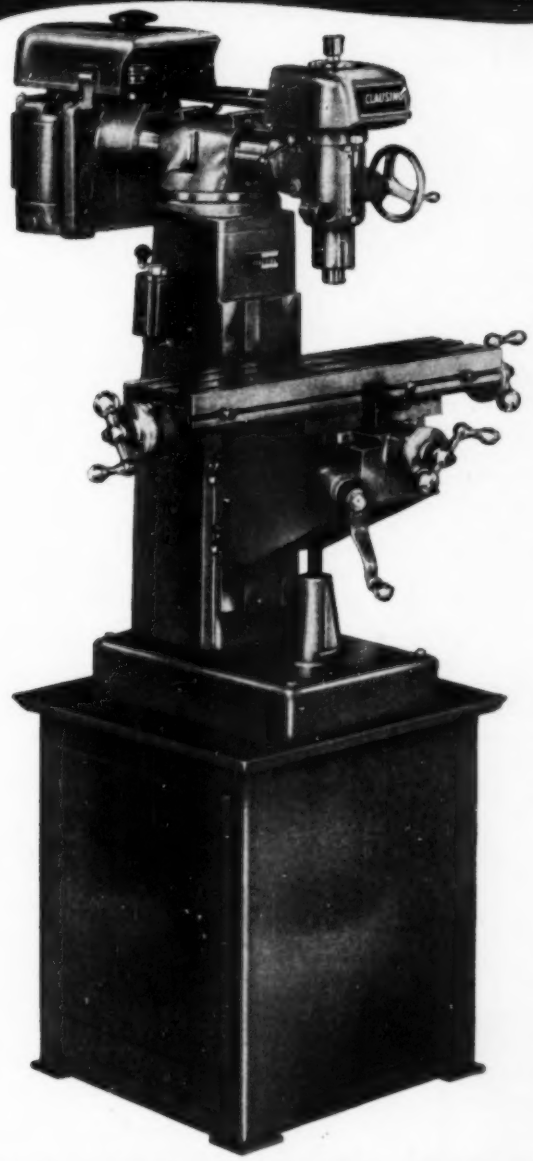

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It has Versatility Plus! Especially designed for tool room, pattern shop and general purpose use, it is actually several machines combined in one. The spindle head can be swiveled in a vertical plane and set at any angle, and turret rotated in a horizontal plane making it possible to mill, drill, bore, ream and shape at all angles, with one setup.

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Quill has micrometer depth control stop and two feeds; rack controlled by lever for sensitive feed and gear controlled by hand wheel for fine feed. All feed screws have ground threads, turn on ball bearings, have large micrometer dials.

Table surfaces and dovetail ways on table, saddle, knee and column are precision ground.

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Size of Table	6" x 24"
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Transverse Table Travel	5"
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Maximum Distance Spindle to Table	12"
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Quill Travel	3"

Spindle Speeds: Six, 180 to 3250 R.P.M.
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Operates from ½ or ¾ HP, 1725 R.P.M. Motor

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ASSOCIATION NEWS

(Continued from page 6A)

tion has set up a central agency to collect and evaluate shop projects for the entire state. If anyone has some, we would appreciate receiving them. Send to K. C. Sinclair, Central High School, Charlotte, N. C.

♦ State officers of the Georgia Industrial Arts Association for 1953–54 are: president, Melvin M. Davis, Stone Mountain, Ga.; vice-president, E. M. Bronson, Atlanta, Ga.; secretary-treasurer, Frank H. McCall, Clarkston, Ga.; executive committee, Dr. O. S. Harrison, Athens, Ga.; and Dr. D. F. Hackett, Collegeboro, Ga.

THE 1953 AVA CONVENTION

(Continued from page 18A of the January, 1954, issue)

The Thursday morning metalcraft demonstration session was devoted to a discussion of design, surface enriching, spinning, soldering, coloring, buffing, polishing, and plating.

The chairman in charge of the session was John L. Feirer, head, department of industrial arts education, Western Michigan College, Kalamazoo, Mich.

The demonstrations were given by Neil Shoenhals, head, Campus School, Industrial Arts, Western Michigan College, Kalamazoo, Mich.; Emerson W. Manzer, metalcraft instructor, Wisconsin State College, Platteville, Wis.; and Morris Overholt, head, metal shop, Grand Haven High School, Grand Haven, Mich.

The session from 9 to 11:00 a.m. was given over to a discussion of "Industrial Arts in 1960."

Frank C. Moore, director of industrial arts, Cleveland, Ohio, was the chairman.

The phases of elementary industrial arts were discussed by Carl H. Hamburger, supervisor of industrial arts, Cleveland, Ohio; and J. Lyman Goldsmith, supervisor, vocational and industrial arts education, Los Angeles, Calif.

Fred O. Anderson, supervisor of industrial arts, Chicago, Ill.; Alfred P. Smith, assistant director of industrial arts, Indianapolis, Ind.; and Kenneth W. Brown, director of industrial education, State Teachers College, Buffalo, N. Y., spoke on industrial arts in the junior high school.

"Industrial Arts in the Senior High School" was presented by Roy G. Fales, AVA vice-president for industrial arts, and chief, State Bureau of Industrial Arts Education, Albany, N. Y.; and Roy A. Radtke, director of industrial arts, Milwaukee, Wis.

Shriver L. Coover, State Teachers College, California, Pa.; and Welcome E. Wright, Texas A. & M. College, College Station, Tex., spoke on college industrial arts.

The talks were summarized by Walter R. Williams, Jr.

Finishing craft materials were demonstrated by Carl Kielisch, General Finishes Company, Milwaukee, Wis.; Jack Falls, M. L. Campbell Company, Kansas City, Mo.; and Peter Zimmer, Pittsburgh Paint Company, Pittsburgh, Pa.

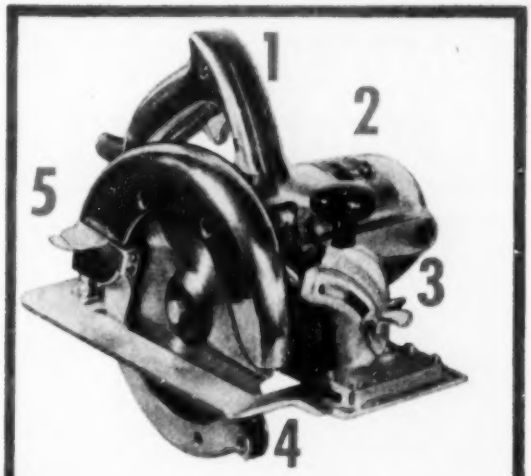
Lynne C. Monroe, professor of industrial arts, University of California, Santa Barbara, Calif., was the chairman of this meeting.

At the session from 2 to 4:00 p.m., Thursday, a panel presented their views on "Visual Methods of Teaching Industrial Arts." Welcome E. Wright was the chairman.

The panel members were Rogers L. Barton, industrial-arts consultant, Texas Education Agency, Austin, Tex.; Donald Maley, industrial education department, University of Maryland, College Park, Md.; Robert A. Tinkham, assistant professor of industrial education, University of Illinois, Urbana, Ill.; and Arthur P. Twogood, vocational education department, Iowa State College, Ames, Iowa.

(Continued on page 26A)

Train them on these new Black & Decker Saws with these up-to-the-minute features



1 Easy-grip handle . . . at natural sawing angle . . . plus *second* hand-hold . . . cord is out of the way.

2 Power to spare . . . on the toughest jobs . . . because all motors are B&D-built *just* for these saws!

3 2-point suspension . . . not one but two big wing nuts hold saw steady at every depth and angle!

4 Huskier build . . . larger shoe . . . for solid base, greater stability on every cut you make!

5 Safety-lift guard . . . large guard lift-lever lets you retract lower guard by hand *safely!*

. . . the tools they'll use because they're the tools industries choose

We asked men in the field . . . carpenters, builders, men in industry . . . *the men who use saws* . . . what they wanted in a portable electric saw. They told us. And now B&D has made these saws, incorporating *all* the features saw users say they want.

Note each of them. In the years ahead your students will have these features to aid them in their work. Why not help your students by teaching them shop practice with the type of tools they will use later?

Like all B&D Tools, these B&D Utility Saws (6″, 7″, 8″, 9″) are built with husky housing and precision parts. Expertly made to exacting engineering standards, they will last and last. In the long run they will prove a great saving over cheaper types. Priced from $64.50. See them demonstrated at your nearest B&D outlet. And write for Saw Catalog. Address: THE BLACK & DECKER MFG. CO., 616 Pennsylvania Ave., Towson 4, Maryland.

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PORTABLE ELECTRIC TOOLS

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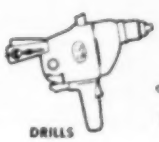
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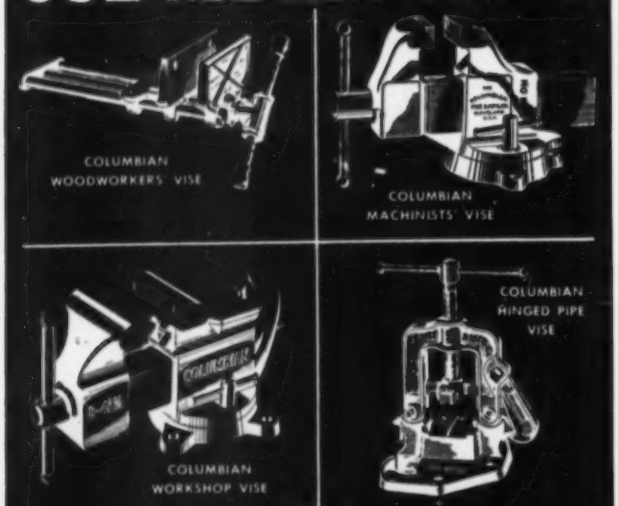
COLUMBIAN VISES



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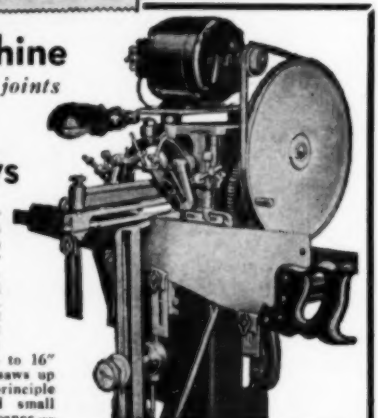
This ONE Machine

automatically files and joints

HAND, BAND, CIRCULAR Saws



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Address.....

School.....

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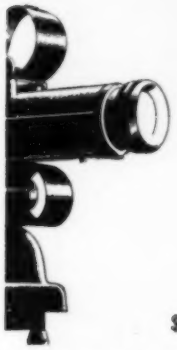

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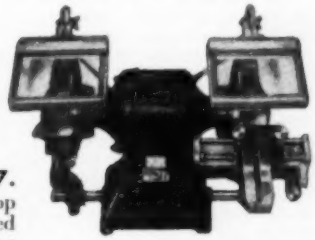

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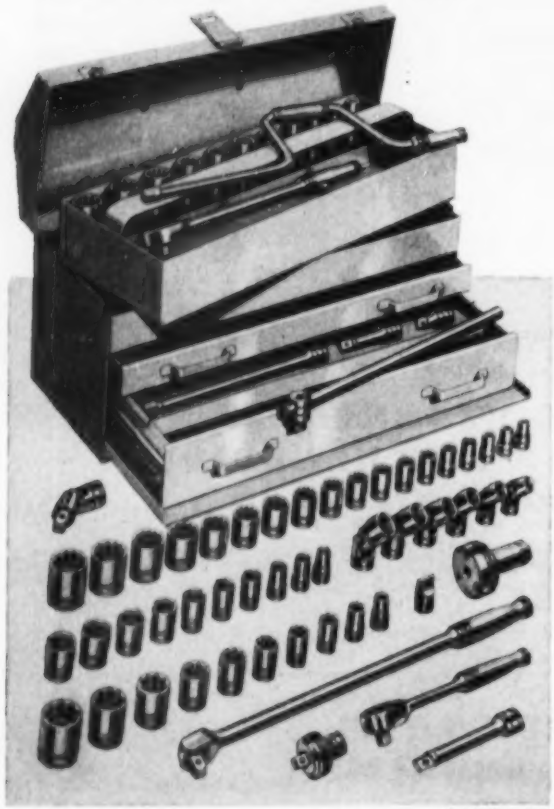

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Combination Hold-Down Pressure Guard Attachment Assures . . .

✔ ACCURACY ✔ SPEED ✔ SAFETY

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Write today for FREE circular giving complete details . . . and specifications on this exclusive jointer safety device. Shows how easily it can be installed on your present 6" Jointers and how greatly you increase safety and work quality. Also write for the new 1954 Duro Power Tool Catalog.

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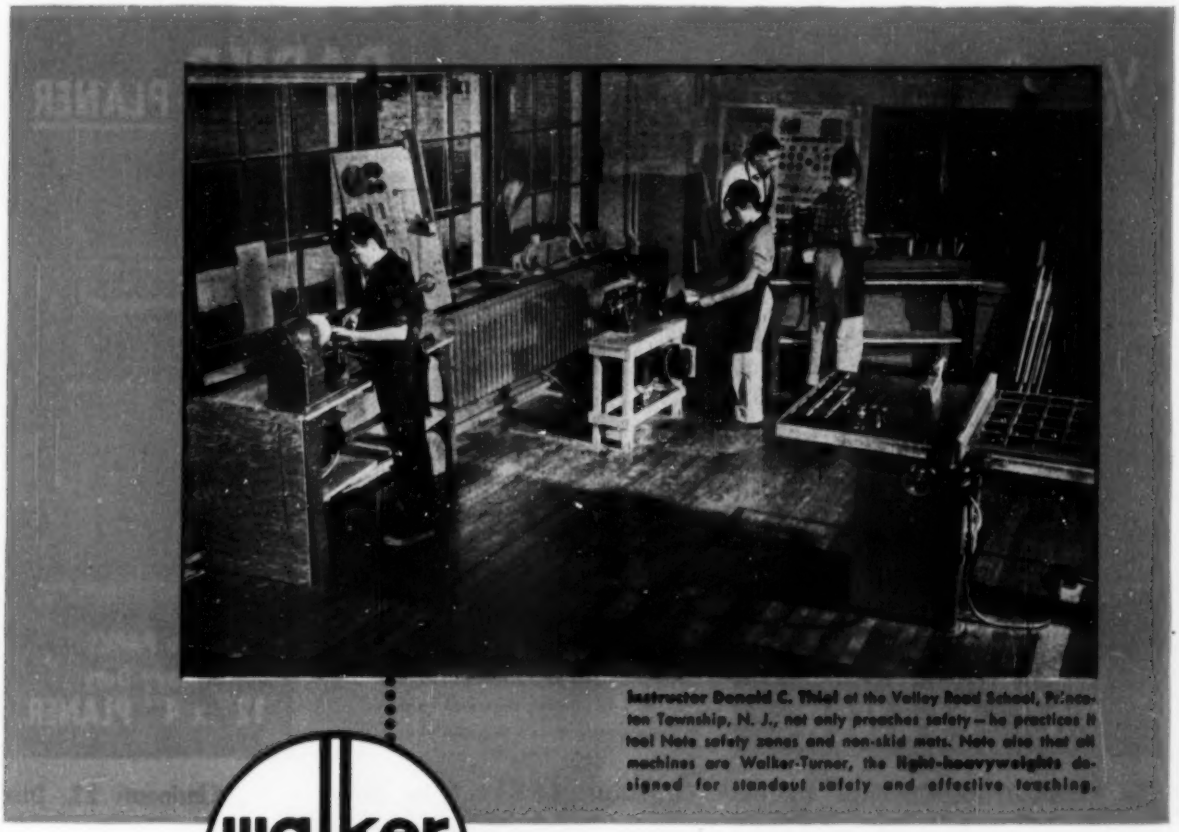

Instructor Donald C. Thiel at the Valley Road School, Princeton Township, N. J., not only preaches safety—he practices it too! Note safety zones and non-skid mats. Note also that all machines are Walker-Turner, the light-heavyweights designed for standout safety and effective teaching.

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They Fit the Students. Here Mr. Thiel took a standard Walker-Turner jig saw, less base, and made a low stand with a seat to permit use by 5th and 6th grade students. Flexibility and adaptability of Walker-Turner machines make it easy to instruct all classes – from beginners to graduates.

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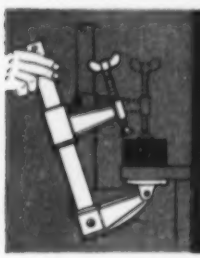

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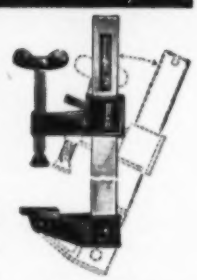

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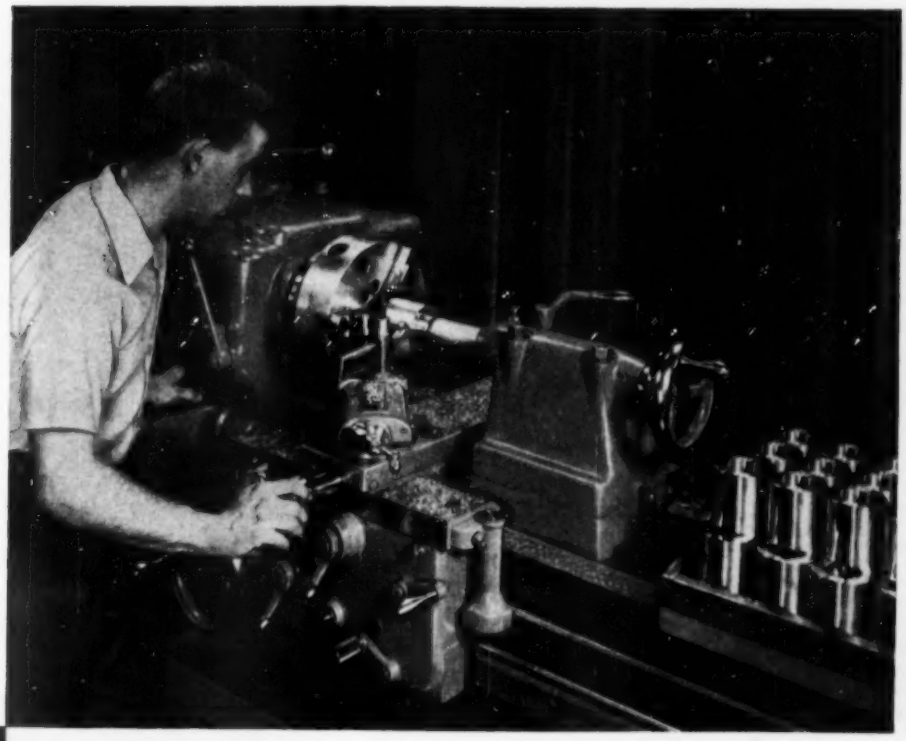

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- - - safer than a band saw, especially for younger students.
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- - - blades rotatable 90° for ripping long stock.
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- - - overall size: 39" high, 20" wide, 38" deep.

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SPECIFICATIONS:

- 60" x 40" x 32", 96" x 40" x 32"
- Heavy gauge industrial "O" type legs.
- 3 Heavy gauge flanged shelves.
- Top is natural color 2¼" laminated maple. Angle iron edges — iron stake plates are flush.

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Prof. Spillman says of this DELTA Unisaw: *"That's a wonderful machine. It's remarkable the way it goes through a piece of wood."* CCNY uses nine DELTA Power Tools in their Industrial Arts Teacher Training Department.

"These DELTA Power Tools are the safest and finest that can be purchased," reports Prof. Albert R. Spillman, Director of Industrial Arts at the College of the City of New York. CCNY's completely modern Industrial Arts Teacher Training Department contains nine DELTA Power Tools.

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*More than 65% of American Schools are equipped with the same DELTA Quality Power Tools so widely used throughout industry, and in home workshops! No wonder DELTA is the natural choice for Industrial Arts Instruction in your school.

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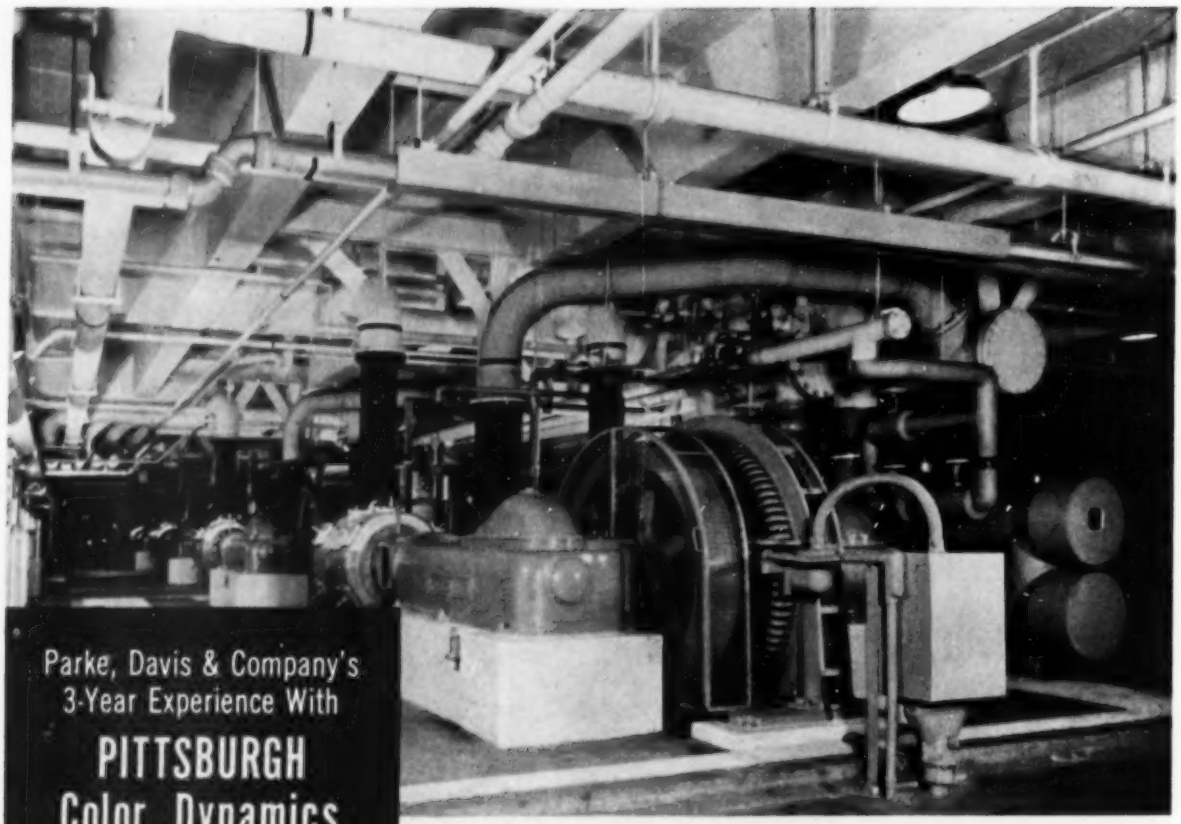

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INDUSTRIAL ARTS and VOCATIONAL EDUCATION
The Shop Teachers' Professional Magazine

FEBRUARY 1954

Origins of Public Industrial Education in Philadelphia

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Public industrial education in Philadelphia has had a rich and even somewhat intricate, historical development. There have been intermingling of private and publicly supported ventures, changing philosophies, and shifting organizational patterns.

Local educators need to learn about almost forgotten events and decisions if the present organization is not to be looked upon as a confused enigma. This local chronicle merits the attention of the general reader because, with few exceptions, all the major movements in American idustrial education have played their part in the Philadelphia scene. The savant who said "a cultured person is one who knows the history of his calling" could not have been far from the truth.

Early Apprenticeship

Philadelphia from the earliest days of its founding in 1682 provided legally for apprenticeship to qualify boys and girls for trades. In 1683 the Philadelphia assemblymen fixed a penalty of five pounds for parents who did not arrange for teaching of children 12 years of age "some useful trade or skill." Although educational provisions soon were made for younger children, indentured apprenticeship grew in strength and importance for equipping adolescents with vocational skills. Before long laws were developed which systematized apprenticeship procedures. Indentured apprenticeships varied in length, depending upon the trade and the entering age of the apprentice. The most common term was five years. The master and apprentice were bound by various obligations. The apprentice was not permitted to marry, could not play cards, "haunt alehouses," absent himself without leave, etc. The master was obliged to clothe and shelter the apprentice, and besides teaching the trade, pay for night schooling, which usually consisted of reading, writing, ciphering, and reading the Bible. According to the comprehensive law of 1763, white apprentice boys must be freed by their twenty-first birthday, and girls on their eighteenth birthday. In 1771–2 there were apprentices in 111 trades, some of the occupations being baker, carpenter, chairmaker, cooper, housewifery, shipwright, and wig-maker. Indenturing the poor was a means of insuring that they would not become public charges. After passage of the Abolition Act in 1780 which provided for the gradual emancipation of Negro slaves, a gradual growth of apprenticeship for Negroes began, increasing particularly after the Friends established in 1822 an institution for Negro orphans.

Notwithstanding the active interest of men like Benjamin Franklin and Stephen Girard, indentured apprenticeship began a slow but unmistakable decline after the Revolutionary War. It is of interest to observe that Franklin in 1790 made a bequest of 1000 pounds to Philadelphia as a source of 5 per cent loans to help young married journeymen set themselves up in business. City council by 1829 had trouble carrying out the will, even advertisements failing to produce more than a handful of qualified applicants. After 1885 the fund was allowed to accumulate, and in 1907 it amounted to $171,000. The next year $130,000 was voted to the building fund for the Franklin Institute.

Stephen Girard left two million dollars for the founding in Philadelphia of the Girard College for fatherless white boys. He provided that boys between ages 14 and 18 were to be bound out in agriculture, navigation, arts, and mechanical trades. Even when the school opened in 1848 difficulty was encountered in carrying out the apprenticeship provision, and in 1881 it was abandoned. Before the school opened committees had been studying the best educational practices in Europe, and as early as 1839 Francis Lieber recommended that workshops be constructed in order that the boys develop health and self-reliance, practical knowledge, and contact with the outside world. The objective of this shopwork would not be to provide wage-earning skills. These recommendations were not acted upon. The 1862 report describes a manual labor department in which a few boys were employed during part of the day in mechanical and horticultural industries. Shoemaking was the first activity. It was stated that manual labor activities made the boys more willing to be apprenticed to trades. It was not attempted to make the shops contribute to the support of the school, but they were maintained on a budget like any other department. The effects of the

1876 Centennial Exposition and the increasing decline of apprenticeship led to the opening in 1882 of vocational metal shops and later to other industrial departments.

Early Private and Philanthropic Industrial Education

The Public Academy of Philadelphia (later the University of Pennsylvania) opened in 1751 with the encouragement of Benjamin Franklin. The instruction of the academy included some mathematics applied to business, industry, and navigation. Other academies which appeared after the Revolution had a more classical curriculum.

During colonial times various private schoolmasters advertised that they taught bookkeeping, navigation, drawing, surveying, and other practical subjects. Fees were charged, and the instruction was generally in the evening.

The accelerating decline of apprenticeship led to a variety of private and philanthropic ventures into industrial education. It is of interest that for many years the major opportunity was available for the orphans, poor, physically handicapped, prisoners, and Negroes. The underlying aim was to lessen the liability that persons in these groups would become public charges.

There are reports that as early as 1712 such materials as colored thread, dyed yarn, and glazed linen were being produced by the poor in Philadelphia workhouses. The House of Employment and Almshouse (1795–96) shows linen weaving, spinning flax, knitting hose, shoemaking, and picking oakum as productive activities of the institution. In these activities learning is incidental to earning an income, but they denote a step from apprenticeship to institutional industrial education. In the 1790's male prisoners in Philadelphia received pay for weaving, carpentry, shoemaking, tailoring, carding wool, polishing marble, and other work. Female prisoners prepared flax and hemp, did spinning, sewing, washing, and mending.

In 1799 some apprentices and clerks organized the Philadelphia Society for the Free Instruction of Indigent Boys. The instruction was in the evening. In 1823 hat making was introduced in the daytime for girls. It was hoped in vain to make the hat manufacturing a profitable enterprise. Later the organization assumed the name of Ludwig Institute, and drawing from models was begun for boys, with sewing machine operating for girls.

Various philanthropic educational opportunities were provided in Philadelphia for Negroes. In 1837 the Institute of Colored Youth of Philadelphia was founded, aided by a $10,000 bequest by Richard Humphreys. The purpose was to prepare the students for teaching. Trade classes were provided in bricklaying, carpentry, printing, shoemaking, plastering, dressmaking, millinery, and cooking. Other institutions for the Negroes opened in subsequent years, some of which like the Berean School, opened in 1899 at 19th and South College Ave., continue to function.

In 1822, the Pennsylvania Institute for the Instruction of the Deaf and Dumb began employing some of the boys in cabinetmaking, shoemaking, and coopering. Instruction in other trades was added later, and the school still functions vigorously. The Pennsylvania Institute for the Instruction of the Blind, founded in 1832, provided vocational instruction to enable the young inmates to become self-sustaining. Early manufactures included shoes, brushes, baskets, mats, and mattresses. Girls were occupied in handicrafts. The Working Home for Blind Men was chartered in 1874. Men were aided in becoming at least partly self-supporting by specialized institutional instruction and work in broom making, carpet weaving, mattress making, and chair caning.

Manual labor has already been described as a method of lessening the expense to the public of supporting the poor, prisoners, and handicapped. Manual labor was later introduced in schools with the recommendation that it had character building values as well as reducing educational costs. In 1828, Reverend John Montieth, a Presbyterian minister, attempted to interest a group of Philadelphians in establishing a local manual labor academy for ministers. The presence of manual labor in the program, it was argued, would preserve mental and bodily health, while improving piety and good habits. In 1829 the Philadelphia Manual Labor Academy was opened. Tables, furniture, and trunks were manufactured. The enterprise failed within a few years.

Further Developments Under Private and Religious Auspices

Industry expanded rapidly, as markets grew after the winning of the independence. Organized labor groups began to exert influence. There was a journeyman organization of printers in 1786. The union of journeymen tailors in 1800 complained to the public of low wages and unjust conduct of employers, citing nine names. In

At left — The Philadelphia Trades School. The first public trade school for white boys in America opened in September, 1906. At right — Murrell Dobbins Vocational-Technical School at Philadelphia.

1827 the journeymen cordwainers struck for a ten-hour day. In the same year the Mechanics Union of Trade Associations was organized in Philadelphia. In 1829 a committee of workingmen advocated greater educational opportunity. A published report noted that education in the free public schools was "spotty" and featured "pauperism." The report was placed in a bill before the Pennsylvania Legislature, and recommendations included the establishment of free high schools featuring "union of industry with literature and science." Legislature did not accept the bill.

As workers became more vocal and influential, they participated in the literary institutes and lyceums which were active between 1814 and 1839. The lyceums, active in seven states, consisted of talks on science by traveling lecturers.

The Franklin Institute was founded in 1824 for the promotion of mechanic arts, but also to educate apprentices and mechanics. Lectures were given, and in 1825 drawing and mathematics schools were founded for sons of masters and apprentices. A high school department was organized in 1826 to give "the sons of tradesmen and other citizens in moderate circumstances the same advantages of education which have heretofore been almost exclusively enjoyed by the children of the rich." Tuition charges were small. A multitude of subjects were taught by a small faculty to tutors who then instructed on a monitorial system. One of the first textbooks on mechanical drawing was developed there, and enjoyed a wide use. The school had a long and useful life before it closed in 1923. The Franklin Institute continues its distinguished work in science and industrial research.

The Young Man's Institute, organized in 1850 set out to encourage the laboring population by establishing free circulating libraries, reading rooms, drawing schools, schools of design, and lectures. A campaign was undertaken to raise $30,000. It encouraged the organization of mechanical and literary institutes in Philadelphia. Five thousand dollars was contributed to the Spring Garden Institute which opened in 1850. Architectural and machine drawing were taught four evenings a week "to respectable classes of young men." As the years went by there was considerable change and reorganization. Woodworking and metal shops were opened, with day as well as evening classes. The institute is still in active operation.

The Philadelphia School of Design for Women was established in 1844. Its directress, Mrs. Sarah Peter, had several years before urged the Franklin Institute to develop a school for "refined women" who were compelled to support themselves. A committee from the institute observed that such a school would provide new fields of employment for females, and also improve manufactures by giving them needed originality in design. At first, tuition was $4 per quarter of 12 weeks for those studying for "paid positions," and $9 per quarter for those studying for "accomplishment." Advanced students were given three fourths of the fees paid by manufacturers of silks, prints, and paper hangings. The 1853 constitution placed the government of the school under a board of 12 "gentlemen" directors. Women directors were not permitted until 1909. In 1932 the school merged with, and assumed the name of the Moore Institute of Art, Science and Industry. The institute had been founded in 1821 under the will of the millionaire, Joseph Moore, Jr., who bequeathed to it his entire estate.

A group of citizens met in 1875 in order to press for the establishment of a museum of art in Philadelphia after the Philadelphia Centennial Exposition in 1876. The British had begun the South Kensington Museum after an international exhibit in London in 1851. The proposed museum was not intended to be a series of static exhibits, but a school of industrial art. It was hoped to secure exhibits from the exposition, and to house them in Memorial Hall in Fairmount Park. The committee on instruction, meanwhile, planned the instructional program. Concern was expressed for the public school preparatory program. The Philadelphia Board of Public Education was urged to introduce instruction in drawing in the public schools. In a report to the Franklin Institute it was noted that the "exclusive literary character of the instruction as no doubt being of the greatest value to residents of the city devoted to letters and mercantile pursuits but incomplete for those who would engage in the multifarious industries of the manufacturing city."[1] The school opened with 100 students in 1877. There were many moves to different quarters, since these were depression years. Classes met both in the daytime and evening. Early instruction was in instrumental and freehand drawing, art needlework, embroidering, and lacework. Both sexes were admitted if they were 15 years of age and could pass an entrance examination in drawing. During the first years tuition was free, and there was income from the sale of materials. Financial difficulties soon forced the changing of tuition. The curriculum in 1880 provided a three-year course in drawing, painting, and modeling. As the textile industry grew in Philadelphia, the Textile Association contributed money and equipment to the museum school for classes in weaving and textile design. About this time wood carving was introduced, then pottery in 1903, and furniture making in 1904. The textile department became a separate entity in 1949, and is now known as the Philadelphia Textile Institute, occupying modern quarters at School House, Lane and Henry Avenue. The Museum School of Art continues at Broad and Pine Streets.

The Drexel Institute was opened in 1892, largely as a result of bequests valued at $2,600,000 by Anthony J. Drexel and his wife. The aim was to afford persons of both sexes opportunity for education and improvement in art, science, and industry. Careful study of existing American and European industrial schools preceded its opening. The first enrollments were in chemistry, cooking, dressmaking, and millinery. Mechanical instruction was later introduced, and the twentieth century saw its gradual change to a collegiate institution. Drexel has for many years featured a co-operative plan in which alternate periods are spent in industry and classroom study.

The Young Men's Christian Association had a reading room and library in a rented property at 162 Chestnut Street before the Civil War. In 1866 classes, chiefly in music and foreign languages, were organized. By 1888, bookkeeping, typewriting, and mechanical drawing were being taught. In 1890 a class in practical electricity was established, followed in 1904 by courses in building construction, sloyd, textile design, and telegraphy. By 1908 there were 54 courses in 98 subjects. The YWCA started a class in dressmaking in 1882. Twelve lessons were given for 25 cents. In 1890 millinery and laundry work were offered.

Protestant, Jewish, and Catholic homes did early work in industrial education for boys and girls. The Industrial Home for Girls was chartered under Protestant auspices in 1859. Girls 12 years of age or over who were beggars or children of poor parents were instructed in housework, then indentured as domestics until they were 18 years of age. In 1866 a home called the Lincoln Institution opened for the sons of Episcopalian soldiers lost in the war. Young mechanics or clerks went to work and attended evening classes at the home. In 1882 the Home of the Merciful Savior for Crippled Children was incorporated under Roman Catholic auspices. This edu-

[1] Proceedings, Franklin Institute, 1877, p. 85.

cational program for the crippled is still active.

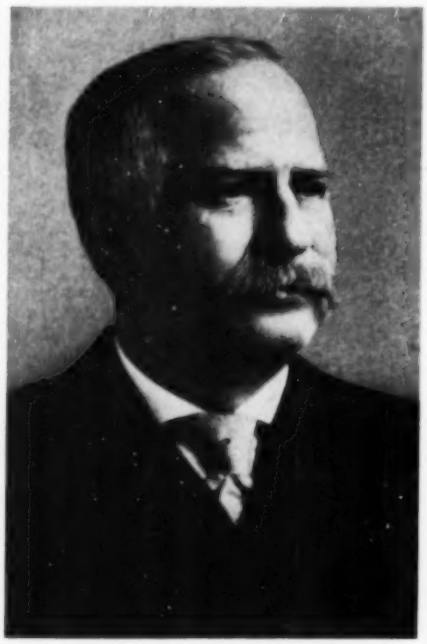
The St. Francis Industrial School was opened with 200 orphan boys on a 200 acre tract of land at Eddington, Pa. Funds were furnished by the daughters of Francis A. Drexel. Boys desiring admission had to be 12 years of age, and pass a physical examination. The first handicraft class in 1888 taught the use of carpenter's tools. By 1892 there was instruction also in carpentry, plumbing, blacksmithing, stonecutting, brickwork, gardening, machine work, and electricity. A Philadelphia branch of the St. Francis Industrial School was started in 1892 to look after employed graduates of the school until age 21. The Philadelphia Protectory for Boys near Valley Forge was opened in 1898 under Roman Catholic sponsorship, for the reform of delinquent boys without discrimination for race, creed, or color. By the end of the century, instruction was reported in farming, tailoring, carpentry, wood carving, and modeling.

The Widener Memorial Industrial Training School for crippled children was founded in 1906 by P. A. B. Widener. It occupies a 30-acre site at Broad St. and Olney Avenue. One million dollars was given for the building, and three million dollars for endowment. Children were admitted between ages four and ten years, must be crippled by disease but not accident, and of good mental power, with promise of becoming at least partially self-supporting. There are no charges. Besides academic instruction and medical treatment, there is teaching of wage earning skills in ceramics, jewelry work, woodwork, radio, and cooking. Since 1941 the school has been operated by the Philadelphia Board of Public Education.

Philadelphia's Public Manual Training Schools Open

In 1818 Philadelphia became Pennsylvania's first public school district. Indigent boys between ages 6 and 14 and girls between ages 5 and 13, could be sent to free public local schools. The Lancastrian system[2] of instruction was used for the teaching of fundamentals, and the girls in addition learned sewing. The average cost, between 1818 and 1821 of educating children was $4 per year. Several state public education laws were subsequently passed. The enactment of 1834 permitted the establishment of a system of common schools throughout the state. Employment at this time of young persons in manufacturing was high, consequently school attendance was limited.

The first public high school, Central High School for boys, was opened in 1837. During the early years, mathematics, surveying, navigation, civil engineering, drawing, and astronomy, were included in the curriculum. The program was intended to prepare boys for occupations in trade and commerce, manufacturing, and mechanic arts. Within a few years the school acquired the right to confer academic degrees. Despite the interest of various individuals and groups in technical and manual instruction, the emphasis turned more and more to the liberal arts program.



Murrell Dobbins

Permissive legislation in 1842 enabled the opening of public night schools. In 1850 schools were opened for night school classes of males 16 years of age and over. Instruction was elementary, and some people alleged that the major achievement was the provision of shelter during wintry evenings. The evening school program was abandoned altogether in 1860. Meanwhile, the private institutions were active, and serving many serious learners. The public night schools were reopened after the Civil War in 1869. By 1893 sewing and millinery were taught, with fashion shows featuring the closing exercises. The program grew throughout the years, and is now a large and important part of the total public school program.

Meanwhile, the Centennial Exposition of 1876 in Philadelphia was wielding its influence on the nation's educators. Especially impressive was the exhibit of several Russian technical schools, featuring models, tools, and work samples in carpentering, wood turning, forging, and metal turning and fitting. Many enlarged models were constructed of tools and machine parts. Professor Victor Della Voss described the procedure in a pamphlet. The products were not of economic value, but the exercises were specifically intended to prepare mechanics. Other exhibits, some in industrial arts, impressed thinking observers with the relative backwardness of the United States. We were importing bronzes, porcelains, carpets, and countless other handicraft products.

The development of the Museum School of Industrial Art and other local private institutions immediately after the Centennial Exposition has already been noted. Edward T. Steel, newly elected president of the Philadelphia board of education began in 1879 a vigorous and unrelenting campaign, urging industrial training in the public schools. In 1880 a private company provided a free course in industrial drawing for Philadelphia teachers. The same year, Charles Leland was given permission to start courses in "minor arts" for local teachers on the third floor of the Hollingsworth School at 15th and Locust Sts. Leland, who had been successful in promoting the Home Arts Movement in England, served without pay. In 1881 he opened afternoon and Saturday classes for selected grammar school children between 10 and 14 years of age. Thirteen teachers taught designing, clay modeling, wood carving, carpenter work, metalwork, and embroidery. A Saturday morning class of fifty pupils was held in metal chasing and hammered brass work. Leland's theory was that "interest in the minor arts develops general intelligence." The program grew and a separate building was obtained in 1901.

(To be continued)

Today's typical railroad tank car can carry about 8500 gallons of oil, although some may carry up to 16,000 gallons. Oil travels by rail, pipe line, truck, ship and barge as it journeys to fulfill its myriad jobs for Americans. — *Petroleum Newsnotes.*

Automotive oils comprise 54 per cent of the sales of all lubricating oils and greases in the U. S. — *Petroleum Newsnotes,* American Petroleum Institute, New York City.

[2]Also called the monitorial system developed in England by Joseph Lancaster. Older students helped the teacher with the instruction of many pupils.

Bringing the Home into the Graphic-Arts Shop

WM. C. SCOTT
Printing Instructor
Wm. D. Howells Jr. High School
Cleveland, Ohio

Printing Education on the Industrial Arts Level

A recognition on the part of the public at large of the importance of the *practical* phases in a child's educational development in our public school system has, during the recently concluded war years, become increasingly more apparent. It seems to me then that, with the groundwork thus more or less prepared, this trend can be increasingly developed by more closely integrating the work of the graphic arts shop in terms of the home with the result that the trend, which is a desirable one, will neither lose its initial momentum nor diminish in importance, but rather develop.

That there may be no misunderstanding of my premise, I hasten to add that I advocate no overemphasis so far as the practical or industrial phase of public education is concerned but rather that the academic and vocational phases of the educative process be more closely integrated with the final result that they will both complement and supplement each other, as indeed they should.

This integration should be and is quite easy to bring about in the case of the graphic arts. To quote only one example, Professor Frank L. Scott of the University of Iowa says, "I know of no means by which a boy can learn spelling, punctuation, and English usage more definitely and more practically."

Graphic Arts Education in Junior High Schools

On the junior high school level, where graphic-arts education is most widespread, instruction in the graphic arts laboratory represents a subject that is purely cultural general education. It also is consumer education, strong in exploratory and guidance values.

The industrial-arts printing laboratory is the one activity through which all subjects and activities in the junior high school program can, and should be, integrated into a whole. English, spelling, art, arithmetic, etc., are emphasized. It is the school service laboratory. In addition it serves to stimulate and vitalize all of the activities in the institution. A four-page, pamphlet-type weekly or semimonthly school paper will contribute tremendously to the integration of the school program and will be economical both in size and labor. Average junior high school printing department equipment found in most junior high schools is adequate for this need.

Industrial-arts printing education furnishes a basic background for a large group of intelligent and appreciative future readers, users, and buyers of printing, when they ultimately go out into the world. As we are all users of printing, this represents consumer education of the highest order. This is accomplished by creating in the minds of the students an appreciation of printing which insures their having for all time a keen and growing interest in books, periodicals, and the printed word in all its forms.

The self-exploration and guidance value of the printing activity in the junior high school program is important. The instruction aims to acquaint the student with the importance of the industry, the varied uses of the different kinds of printing, as well as to explain and illustrate the basic printing processes and methods, the materials and equipment employed and the opportunities for a career. The work in the printing laboratory, as well as that in the several other industrial-arts laboratories offers opportunities for prevocational tryouts and, therefore, represents a sifting, screening or aptitude testing period. It thus has a definite educational and vocational guidance value.

Graphic-arts education in the junior high school is one of several practical courses that the students should take because it represents one of our most important major industries and is closely related to educational objectives. Thus any indication or aptitude for one occupation or another may be noted. At the same time the student will receive some general knowledge of the significance of the trades thus touched upon. An occasional industrial-arts student of printing discovers an interest in this field and *finds* himself for the industry. He should naturally go on into vocational or trade study. That natural process of selection is part of a well-organized and administered school system. But the vast majority of the many thousands of young men and women who study the fundamentals of printing are in no sense headed toward the graphic industries as workers. Junior high school graphic arts has no direct trade training objective.

The writer wants to make clear that the teaching of graphic arts in our schools is challenged by two trends of thought. There is one group which visualizes the teaching of this subject as purely industrial with the idea of job possibilities alone, and the preparation of the student for the trade. This group is known as the *teachers of traditional printing*, who teach strictly tradeprinting such as typesetting, lockup, presswork, stock cutting and shop maintenance, and management. Second, and more correctly is the group which views the subject from the cultural, aesthetic, and most important general educational angle.

In the writer's opinion the traditional printing course and the methods of teaching it are definitely on the way out. These are being replaced by more progressive teaching methods and the broader pupil centered graphic-arts laboratory courses which have been, and are being developed throughout the Cleveland system.

Traditional printing has been too narrow in its application. It has been limited largely to exercises in learning the type case, spacing and justification of lines of type, styles of indention, use of punctuation marks, proofreading, and theoretical learning about various items of related information. Instead of giving pupils a

broad conception of the important graphic-arts field, all too much time is consumed in typesetting skills, press feeding, and stock cutting. Some of the better pupils set type on school forms and otherwise help in the production of schoolwork. But production work, generally speaking, has very little instructional value, and is a perversion of the facilities of the junior high school printshop.

The graphic-arts laboratory idea for some time has received the study of some of the printing instructors. Experiments are being carried out successfully on such units as silk screen, bookbinding, linoleum block printing, layout and design, papermaking and the study of advertising from a consumer standpoint. A unified course of study, however, has been left to the discretion of each teacher.

In my opinion, the future of printing education is and will be changed radically. No longer will boys come into the print shop to set up stereotyped exercises for purposes of drill; no longer will the junior high school shop be exploited to do production work which is produced by the instructor with the aid of a few exceptional boys and the remainder of the class left to shift for itself pending the completion of the work; no longer will boys be permitted to operate the platen presses for hours to print jobs which to the boy have very little or no educational value after the first few impressions; no longer will printing teachers be interested in that narrow conception of printing as a service subject which has been so strongly approved and lauded by uniformed administrators; no longer will printing teachers tolerate the printing instructor who says, "Well, my principal wants production printing, so I give it to him in order to hold my job," and who as a substitute for instruction, gives the class a lot of busy work which carries no challenge to the boys; and no longer will printing teachers accept the viewpoint of printing being taught under the false label of high-sounding *pedaguese* in order to make it convenient for the administration of a school to get printing done which does not fit into a well-rounded course of instruction.

But on the contrary, printing teachers will insist that courses of study be established which will give all pupils a broad understanding of the tools, materials, and processes of the graphic-arts industries, so that they may become better and more discerning consumers of printing; so that they may have a better appreciation of art in printing; so that they may have a more wholesome respect for books, and a desire for their care in the home, school, and library; so that they may obtain experience which will develop a just price in personal achievement; so that they will be given the opportunity to produce things of value to themselves which are useful and beautiful; and finally, so that they will get the opportunity of obtaining work experience under conditions which will instill in them those attitudes of co-operation and service so essential to active participation in our democratic way of life.

I believe that the graphic-arts laboratory properly and adequately equipped and staffed by progressive teachers will do much to make printing education a vital factor in the conservation and development of the human material so vitally needed to make our democracy function.

Some of the classifications that could be taught in the junior high graphic-arts laboratory are as follows: hand-printing press projects, linoleum-block printing, bookbinding, consumer advertising, consumer layout work, silk-screen printing, and papermaking. There are others equally important that could be and are being taught in the junior high school level today but time will not permit me to discuss them all.

How to Make the Home a Part of the Graphic-Arts Shop

In some of the other industrial-arts classes it is comparatively simple to bring the home into the industrial-arts class.

Since the advent of the graphic arts laboratory, which includes many more classifications of work beside typesetting and presswork, it is possible to have the graphic-arts pupil bring the home into the shop.

In any shop whether it be in industry or in school, there must be some form of organization of its occupants if the shop is to run efficiently and successfully. One of the easiest and best ways of teaching graphic arts and bringing the home into the shop, is by the rotation system, which is nothing more or less than shifting the student from one classification of the graphic arts to another. In this manner he covers the entire program of the course in a semester, exploring each of the allied branches of printing and having an opportunity of connecting the home to the shop.

In the writer's shop there is a large board with thirty screw hooks. On these hooks are numbered tags bearing the numbers, one to thirty. Above each row of five tags are the classifications; typesetting, presswork, linoleum block printing, bookbinding, miscellaneous, and silk screen printing.

At the beginning of the semester each boy is assigned a number and a bench. He obtains his materials from the tool crib keeper by having it charged out to his number. The first assignments are made numerically, that is numbers 1–5 are assigned to typesetting, 6–10 to presses, 11–15 to lineoleum block printing, 16–20 bookbinding, 21–25 to miscellaneous, and 25–30 to silk screen printing. Each boy works on his assigned classification for one week and at the end of that period the class foreman changes the tags to another branch of the graphic arts. I believe this system to be good in that it gives every boy an opportunity to cover the entire graphic arts course and not tie him down to any specialized form of printing.

Let us follow through each classification and find out how the home can be brought into the graphic-arts shop.

Typesetting: In typesetting there are many things that can be set up and printed for the home.

One project that has been most successful with the 8B grade is a "Favorite Recipe Book."

Each boy is assigned, as extra credit work, the responsibility of bringing into class one of his mother's favorite recipes, complete from start to finish. It is amazing to find in a class of 30 boys only one or two duplications. The pupil then may set up the recipe, correct it, and tie up the type for the press. He may then print 50 or 60 copies of the recipe and hand them in. After each boy has done this, the various recipes are sorted into groups and a cover printed for them and they are bound into small books. The students are each given a couple of books to take home to their folks. The reaction of the mothers in finding their recipes printed in this booklet with 29 new recipes for them to try out is very favorable.

Another project, may be letterheads and calling cards for mother and dad, printed in two or three harmoniously blended colors. Everyone is vain enough to like to see his name in type and to be the proud owner of his own stationery and calling cards. It is a great public relations builder.

Another job that is well received by most parents is the printing of napkins with their names on, to be placed at the table when guests arrive or passed out at buffet lunches or teas. Mother especially likes to boast that her boy dashed these off at school. Place cards for future occasions are always an addition to the family table. The printing of dad's name on book match covers to be passed out by proud papa at business meetings, social gatherings, and luncheons are always a big hit among men. The printing of a memo pad

for dad's desk at the shop or office is another excellent way for pop to show off his son's ability in school. Gaily colored party invitations for parties at holiday and birthday time make a big impression on Sis. She will have *arrived* socially through the help of her brother and the graphic-arts shop.

Other projects which have been accepted enthusiastically by the home is the printing of a class booklet with a three paragraph autobiography of each boy in the class. Booklets of famous men — one page contributed by each member of the class, are popular. Sports booklets of famous men in athletics, one page written and printed by each student have been popular, both with the pupil and the parent. A booklet of the famous birds of our state is another fine project.

These are a few of the jobs that can be and are being done in one classification — typesetting, to help bring the home into the shop.

Presses: When the pupil is transferred to presses on the rotation system, he may run his job off on either the power press or a hand press. The hand press — a pilot press is a fine piece of equipment and every shop should have one.

Due to the fact that there are five boys on a *team* it is comparatively simple to work in pairs and help each other get the jobs on and off the presses.

This not only lets the boy print his own job but by doing so he becomes acquainted with the press, its care, maintenance, safety, and so on. He will learn the mechanical workings more rapidly if he is working on his own job than if he were running off some school form in which he was not in the least interested.

Linoleum Block Printing: Linoleum block printing combines the drawing, cutting, and printing of designs, cartoons, monograms, or silhouettes on linoleum. It is particularly adapted to the print shop program because it affords an opportunity for concrete correlation between the designing and cutting of the block and the mechanical method of reproduction. The fact that this close relation does exist enables the student to realize and explore all of the varied possibilities of the art.

In linoleum block printing there are many projects that can be made to tie the home and the graphic-arts shop together.

One interesting project that has been popular in our school is the printing of linoleum block designs on dish towels for the kitchen. The student draws or copies a design, cuts the block and then prints this design on the ends of cut linen cloth. He uses a heavy ink so as to get a clear, sharp print. Some of these towels have been accepted with much enthusiasm by the boys' mothers.

Linoleum block printing offers the opportunity to illustrate personalized Christmas cards, holiday invitations, and place cards.

Still another, but more delicate, project is the printing of linoleum block monograms on handkerchiefs, to be given as gifts to the family.

Some of the direct results of linoleum block printing are that this art tends to form a worth-while hobby for leisure hours at home. It is inexpensive and needs little equipment. It is the type of hobby that may be laid aside and returned to without any loss of efficiency or interest. Linoleum block printing can help to develop an aesthetic taste in the appreciation of fine arts. It creates an artistic interest that probably would not have been aroused if the boy had not undertaken the art of linoleum block printing. This phase of the graphic arts opens an explorative field for the boy. It gives him a feeling of pride to be entering into a new and different field.

Miscellaneous: In this classification of the graphic-arts shop the student is given the opportunity to organize his work. For example, the pupil who has printed stationery and cards for home use can distribute his type back into the cases. The boy who has run off holiday cards may fold them and place them in envelopes ready for delivery.

He may be assigned to the tool crib or to help some other lad complete a job. In short, miscellaneous means just what the word implies — *anything and everything*, an assortment of odd jobs around the graphic-arts shop.

Bookbinding: The subject of bookbinding can be introduced into the school print shop inexpensively and with very little effort on the part of the printing teacher. Much of the equipment and materials necessary for bookbinding are already a part of the print shop. In fact, with improvised equipment, a rudimentary knowledge of bookbinding, and with a dollar or two spent for supplies, the printing teacher can proceed with bookbinding in his classroom.

Bookbinding is not a fad or a fancy but a fundamental educational process antedating printing from movable type. In modern times it can serve all phases of printing be it letterpress, planographic, or intaglio. Printing, with the aid of bookbinding, will make possible a wide variety of pupil projects.

Long periods of drill in fundamentals are not necessary in bookbinding, in fact the pupil can make useful projects at the start. Advancement to more complex projects depends upon pupil interest and his ability to assume responsibility.

This particular branch of the graphic-arts laboratory offers a widespread choice of projects that are not only educational to the pupil but interesting to make. Most of these projects tend to tie the home and the shop together.

Address books, autograph books, photo albums appeal to the brothers and sisters, while a desk pad and a leatherette enclosed memo pad for dad's office is a welcome gift. Women are always in need of kitchen reminder pads or telephone message books. Mom could also use a telephone directory cover. Big brother can use a notebook cover and a scrapbook for high school activities. Advanced students may also make bathroom wastebaskets made with binder's board and book cloth which are additions to the modern home.

This type of project has proved more interesting to the pupils than the binding or mending of books for the simple reason that the students are creating something that they can use themselves in their daily contacts at home and in schoc

Bookbinding complies with the best educational objectives of general education. It provides exploratory experiences in a wide range of tools, materials, and processes. It also has great possibilities for consumer and avocational developments.

Silk Screen Printing: The silk screen process is a method of stencil reproduction in which the stencil is supported by a piece of tightly stretched silk (or similar material) through which paint can be forced.

Being a highly flexible medium of reproduction which can be employed with equal facility for printing on practically any type of surface from glass to wood, it has flourished into a thriving industry. The basic principles are the same whether adapted to simple paper stencil sign work, or intricate multicolor poster or textile work; whether the surface be a "Micky Mouse" drinking glass or pair of kitchen curtains; or whether the subject be a photograph or a hand lettered poster.

Because of its flexibility, and because of its ability to lend itself to simple, unskilled techniques, the silk screen process becomes an ideal area of industrial-arts education. The equipment required for its installation is not bulky nor expensive. The frame and other equipment require but a minimum of storage space when not in use, and for an initial outlay of only a few dollars, the valuable nucleus of a new activity can be laid.

This classification can do much to bring the home into the shop. Beautifully colored, silk-screened holiday cards can be produced through the silk screen process. Figured bathroom shower curtains are not too hard to print. The design is durable because of the oil paint used in the silk screen work. Little brother's junior football team can have their teams silk screened on their sweat shirts. It is possible to silk screen a simple design on a canister set for mother's kitchen. The family monogram can be reproduced on serving trays. This classification like most others in the graphic-arts shop has many ramifications which can connect the home and the graphic-arts shop.

Summary and Conclusion

The fact which has become increasingly apparent to the writer over the years is that so many opportunities exist to bring the home and the graphic-arts shop together, and that utilizing these opportunities is not the difficult task which many instructors seem to believe it is.

This may be accomplished by bringing more areas of the graphic arts into the shop and placing greater emphasis on the pupil and his individual projects than trying to develop any industrial skills.

Because of the many diversified areas in the graphic-arts field, it is extremely easy to have a definite tie-up between the home and the shop.

We, in the industrial-arts shops have the opportunity of public relations at our finger tips, much more so than the academic classroom teacher because we can show tangible evidences of a concrete correlation between the home and the shop. To us this should not only be a challenge, but an opportunity to weld together the home and the school.

What Is Your Educational Philosophy?

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If someone were to say to you, "Mr. H—, what is your philosophy of education?" how would you reply? Could you give him a coherent and intelligent answer or would you *hem and haw* and finally admit that you have a philosophy all right but at the moment you just can't express it?

It is not inconceivable that someday you may be confronted with such a situation. In fact, if you were being interviewed for a teaching job one of the very first questions a superintendent might ask would be concerning your particular educational philosophy. Moreover, your principal, supervisor, or even a layman may stop in your shop and inquire what your program is contri uting to the basic structure of a youngster's education. Without a well-conceived philosophy, you would have some difficulty answering this query.

Good teaching requires a sound educational philosophy and the effectiveness of your job will be greatly influenced by the genuineness of your philosophy. Without some well-founded concepts of the function of general and industrial education your teaching is likely to be somewhat haphazard and probably fail to achieve its desired end. At the most, instruction without an adequate philosophical backing becomes merely a dissemination of factual knowledge and heterogeneous skills which usually fail to provide the type of learning desirable for maximum pupil growth. It is granted that under some circumstances an excellent task may be accomplished in dispensing the materials and skills of your subject. But unless there is full cognizance that teaching woodwork, for example, simply as a course in woodwork or metalwork as a metalwork subject without realizing the significance of other essential attainments, then such teaching, at its best, is only a poor substitute of the true implications of constructive teaching. The knowledges and skills learned in any subject do not begin to assume their rightful proportions unless you, as a teacher, possess a clear vision of the total pattern of education and diligently plan your instructional activities to assist in shaping and developing this pattern. By and large it will be physically impossible to envision the total picture of education unless there has been formulated some fundamental beliefs of what education should be and what it should do. In reality, then, a philosophy is nothing more than your creed, your code, your belief, your guide in keeping instruction headed in the right direction. It furnishes the essential ingredients that make your teaching functional.

What are some of the so-called components that enhance the degree of realism in any educational program? They are nothing more than honest convictions regarding various methodologies or principles in educational practices. Here are a few stated in question form; others could be added.

1. What is the function of general education?
2. How much general education should be required for all students?
3. How can appreciation for our democratic form of government be taught effectively?
4. How can respect for leadership, authority, law, and order be developed?
5. How can social and moral responsibility be developed for community needs?
6. How can people be taught to live, play, and work together?
7. How can individuals be made to appreciate and respect the influence of the home and church?
8. What particular attitudes should pupils develop regarding the cultural heritage of Western civilization?

9. At what level in the education program should industrial arts be introduced?

10. Should all boys and girls be required to take industrial arts?

11. Should the objectives of industrial arts differ from those of general education?

12. How can the teaching of industrial arts in the elementary, junior, and senior high school be justified?

13. What does industrial arts contribute to the education of a child that is not obtainable in other study areas?

14. At what stage of the educational program should vocational education begin?

15. Should general education be included in a strictly vocational training program?

16. Should vocational industrial training be provided at high school level?

17. Should area vocational schools be established to provide training opportunities for those who would otherwise not be able to attend such schools?

18. How can terminal courses be justified?

19. At what level in the educational program should terminal courses be offered — high school or junior college?

20. Should vocational training be compulsory?

There are a few typical questions which you should be able to answer readily. Undoubtedly your opinions on some of these may change from time to time, and rightfully so. As new influences begin to affect our credences of the potentials of education, then naturally your viewpoints should be altered in order to keep in harmony with these changes. It is sometimes very helpful, when trying to fashion an intelligent educational philosophy, to write out what you think regarding various basic principles. You will find that such a procedure will do more to stimulate and straighten out your thinking than anything else.

It is regrettable that many of our people leave teacher training institutions without having developed a concrete educational philosophy. How fortunate it would be if all prospective teachers, upon completing their college training, had a well-established philosophy. Unquestionably, this would result in more creative type of teaching. Certainly, it would be extremely profitable if someone could assume the responsibility of saying to senior students something like this — "You are now about to go out and teach — you have spent four years getting ready for it — you have taken many courses, some dealing with knowledges and skills which you are expected to teach, some dealing with the principles and psychology of learning, some concerning teaching techniques and many others pertaining primarily with general education to give you a wide background in the cultural, social, and economic implications of our social world. However, very little time has been devoted thus far to actually showing you some of the relationships of many of the courses and frequently you may have been puzzled as to the function of some of these studies. Because you are intelligent young people it is often assumed that you can take the initiative to weave the maze of courses into some logical pattern and thereby evolve a philosophy that will give you insight, a guide and a purpose in carrying out your duties as a teacher. In most instances such a task becomes too prodigious since you were never actually taught how to put this vast array of intellectual knowledge into some meaningful form. Well now, let us see if at this stage we can't discuss some of the ramifications of what you have learned and thereby give you an opportunity to crystallize your thinking in order that you may piece together a meaningul philosophy that will help you do a successful job of teaching."

The implementation of the foregoing may be difficult but it is a decisive conclusion that such a plan will enable more prospective teachers to foresee clearly their many obligations and be better able to solve their numerous problems during their probationary teaching period. There is every reason to believe that the development of desirable teaching ideals is of greater significance now than heretofore because of the need for better qualified teachers who can cope with the ever increasing complexity of teaching problems brought about by the extremely complicated social life of today. Since a sound philosophy is a *must* for good teaching, those responsible for preparing teachers should assume the leadership in establishing a plan to achieve this objective. On the other hand, those charged with the actual supervision of teaching in the field have an equal obligation in seeing that teachers maintain an up-to-date philosophy. Finally teachers, themselves, if they are proud of their profession and wish to render useful service, should consider it their duty to develop a worth-while guiding philosophy. All interested in teaching, therefore, must unite on this problem.

Confusion in Terminology

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The present status of terminology in the total program of industrial education, the various and sundry definitions, meanings, interpretations, and misunderstandings connected with the program is analogous to the story of the three drunks arguing about what animal was man's best friend. The first drunk spoke in favor of the dog and gave many fine examples of his loyalty, devotion, etc., to man. The second drunk was equally vigorous in support of the horse and extolled at great length its virtues and what a boon it had been to mankind. The third drunk, however, avowed that it was neither the dog nor the horse but in reality the male alligator that was man's best friend. The reasoning for this choice was as follows: Every year the female alligator goes up the river and lays 10,000 eggs on the river bank. Right behind her comes a male alligator who eats 9,999 of the eggs. Man alive — if it wasn't for the male alligator we'd be knee-deep in alligators. Such is our current position with respect to definitions and any general agreement or understanding of the many and varied terms in the industrial education field — we're knee deep in a confusion of definitions and terminology.

How does it happen that such confusion exists and what is the evidence of its cur-

rent existence? Part of the disparagement in terms comes about naturally as a part of the evolutionary processes in the growth and promotion of industrial education programs in many forms. Our present term of industrial arts has been the result of modification, and change in pedagogy and psychology, i.e., manual training, to manual arts, to industrial arts. Even a cursory examination of reports and literature of the general schoolman will reveal frequent usage and reference to all or any of these terms in most any state or region. In the past industrial education has been used to refer to many types of vocational education and is currently used with a variety of meanings. If you are a college teacher and want to try an interesting experiment, have your students write out definitions for such common terms as general education, industrial education, vocational education, vocational-industrial education, and industrial arts. Unless your students are totally unlike the ones in my experience you will find an amazing lack of ability to define or differentiate clearly or even partially between some of these terms. This is true of graduate students as well as undergraduate. Maybe this is natural, but if so it should be alarming to those promoting such programs. Students in the more traditional fields of mathematics, English, history, biology, foreign languages, and so forth don't have this difficutly at all. Moreover, even the general public understands, or think they do, what teachers in the traditional fields are doing; but not so with industrial arts. Just imagine yourself trying to explain to the average parent what you are teaching in terms of industrial arts by using a good modern definition of the term. You will probably end up by explaining that you teach shop or woodworking or something of that order. And no doubt the parent will have a better idea of what you are doing.

One of the best examples of the current confusion which besets our field is the recent U. S. Office of Education publication, "Offerings and Enrollments in High School Subjects, 1948–49."[1] This is the tenth survey of this type made by the Office of Education, dating back to 1890, yet it is the *first* time industrial arts has ever been listed separately from other industrial subjects. Even so it is listed as "Industrial Arts — Nonvocational."[2] Confusion? Yes, and there is more to follow. Listed in the offerings for industrial arts are the following: "Industrial Arts I and II."[3] Now if anyone can figure out what these classes include he must be a near relative of a "genie." Many more instances of this type of nonsense could be presented but enough of this — now to get on with some suggestions for clarification, simplification, and standardization of a few of the common everyday terms in the over-all field of industrial education.

First, let's look at the broad general term, industrial education. And that's exactly what it is — a broad general term — not a substitute name for industrial arts, vocational education, or any of a number of other forms of education that could be mentioned. Industrial education is a study of the tools, materials and processes, and the opportunities, requirements, and working conditions in industry. As such it is a generic term including such industrial programs as industrial arts, vocational-industrial education, apprenticeship, teacher training, and various forms of in-plant-training. It is readily seen then that industrial education includes both general education (industrial arts) and vocational education (all the others). Thus, when talking about some specific program it is wrong to use the generic term and conversely, proper when speaking of an over-all program embracing both general and vocational education.

Now to consider the general education phase of industrial education, industrial arts, which has been defined as those phases of general education which deal with industry — its organization, materials, occupations, processes, and products — and with the problems resulting from the industrial and technological nature of society.[4] Again we have a somewhat generic term which doesn't tell exactly what is being taught, it only indicates the purpose of the program — objectives if you please. Specifically, we find work in such typical areas as drafting, wood, metal, electricity, graphic arts, and crafts. When we combine some of these into one room we usually call it a general shop and here again enters much confusion. It seems that we have several types of general shop — composite general shop, comprehensive general shop, limited general shop, and just plain general shop. Now are these all the same, all different, or some kind of a mixture? Most of us would agree that numbers one, two, and four are the same; it is a shop in which several areas are represented, all going on at the same time, and usually taught by one teacher. Number three is a shop limited to only one area of industry, for example, general woodworking — a woodshop in which one might expect to find many areas but all related directly to woodworking. Now why couldn't we dispense with this sort of thing by calling all multiple area shops simply "general shop," and the general shops in one area by the name of the area represented, for example, general woodworking, general metalworking, general drafting, and so forth. If such simplification could be promoted we would then make real headway toward accurate reporting, labeling, and general understanding.

The programs listed under the heading of vocational industrial education are more easily understood but still remain confused with the terms vocational education and industrial education. Unfortunately, in my judgment, vocational education has come to mean only those types of education provided for under the federal vocational education laws. According to any standard dictionary this simply isn't so since vocation is defined as one's job, occupation, or chief way of making a living. Hence, any type of training (education) for any specific occupation (vocation) or occupational field is vocational training (education); whether it requires specialized college training, serving an apprenticeship, or attending trade school. Much improvement needs to be made with respect to an over-all concept of what vocational education is and thereby bringing about a revision of the present limited and narrow concept.

Since considerable confusion in terminology and a general misunderstanding of many of the terms in the industrial education field exist, how can improvement be brought about? Let's broach the entire problem through our national and state organizations and thereby come to agreement on terms. From there we can con-

[1] "Offerings and Enrollments in High School Subjects, Biennial Survey of the U. S., 1948–49," Federal Security Agency, U. S. Government Printing Office, Washington 25, D. C., 1951.

[2] *Ibid.*, p. iii.

[3] *Ibid.*, p. 64.

[4] Gordon O. Wilber, *Industrial Arts in General Education*, International Textbook Co., Scranton, Pa., 1948, p. 7.

centrate on standardized terminology through our teacher training institutions, in our public schools, and other agencies engaged in collecting and classifying information. No doubt there are other means of attacking the problem, if so, let's uncover them and get at the job. Finally, no claim is made as to the originality, completeness, or finality of any of the terms and definitions presented here, but if they are valid and acceptable, well and good.

Leaders in Industrial Education

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DAVID SAMUEL SNEDDEN

(Concluded from page 21 of the January, 1954, issue)

Lectures and Short Courses

Dr. Snedden was in constant demand as a speaker before meetings of teachers, beginning with his work in County Teachers Institutes early in his career. These engagements increased in frequency and often in length, especially during the 20 years of his final term of service at Teachers College.

Publications

It is impossible to give in the space available an adequate account of Dr. Snedden's voluminous contributions to educational journals, just as it is impossible to list all his lectures, addresses, seminars, and courses in summer schools.

In books published he made major contributions to several areas in addition to that of vocational education.

Conclusion

Looking back on his career, after his retirement, Dr. Snedden said of himself that he never had a real hobby, and admitted that there was some basis for the observation that "he never learned to play." He observed that he "never enjoyed the lighter social conversations and meetings of congenial people," except in the more or less serious gatherings of professional friends and associates, as, for example, in the professional clubs to which he belonged. He made acquaintances easily "only among people of intellectual interests nearly similar to his own."

Although he says nothing to indicate it in his *Recollections*, I learned from a mutual friend in California that Dr. Snedden was at first disposed to resent his enforced retirement from the Teachers College faculty in 1935, at age 67 years. He complained bitterly that, since he was still in excellent health and vigor, he was capable of continuing to render valuable service for an indefinite period. Further, he argued that the policy of retiring workers at any arbitrary age is certain to deprive society of the valued services of many individuals who may still be at their prime of usefulness.

However, after he retired to Palo Alto, he soon became engrossed in the project of disposing of his former home and building a new one near the Stanford University campus. He received a number of invitations for lectures and teachers institute work, and he continued with his writing on subjects in which he maintained a lively interest.

Vocational Education Magazine

Some account must be given of Dr. Snedden's activities in what is now the American Vocational Association. He was not a member of the original conference called by Professor Charles R. Richards and Dr. James Parton Haney, which met at the Engineers Club in New York City, on June 9, 1906, to consider the advisability of a national organization in the interests of industrial education. However, he did attend the meeting which was held in Cooper Union on November 16 of that year, at which it was decided to organize the National Society for the Promotion of Industrial Education. At this second meeting a constitution was adopted, officers were elected, and plans were laid for the first convention, which was held in Chicago, in January, 1908.

Following the enactment of the Smith-Hughes Law in 1917, which had been a primary goal of the Society, a change of name was decided upon, and it became the National Society for Vocational Education. Dr. Snedden was elected the first president of the reorganized Society, and he served for two terms, 1918–20.

During his term as president, and later, Dr. Snedden urged the publication of a journal devoted to the interest of the Society and of the movement. He was instrumental in having a committee appointed to make a thorough study of the needs and the possibilities, and to make recommendations. At the convention held in Kansas City, in January, 1922, the recommendations of

the committee were adopted, and the publication of a monthly journal was authorized, to begin in the fall of that year. The name adopted was the *Vocational Education Magazine*, and Vol. 1, No. 1, was dated September, 1922. The first issue contained 96 pages, including four pages of advertising, chiefly of equipment for shops and drafting rooms, and the size of the page was 9 by 12 inches.

It was announced as a monthly magazine, to consist of ten issues, July and August being omitted. It was published by the J. B. Lippincott Company, Philadelphia, and the subscription price was $3.

Dr. Snedden was named editor-in-chief, and he was advised and assisted by an unusually able editorial staff, including the following persons, representing the areas indicated:

Agricultural Education, George Alan Works, professor and head of the Department of Agricultural Education, Cornell University, Ithaca, N. Y.

Commercial Education, Frederick George Nichols, associate professor of commercial education, Harvard University, Cambridge, Mass.

Homemaking Education, Mildred Weighly, professor of home economics, University of Minnesota, Minneapolis, Minn.

Industrial Education, Charles Allen Prosser, director, William Hood Dunwoody Industrial Institute, Minneapolis, Minn.

Part-Time and Continuation Schools, Robert Jocelyn Leonard, professor of vocational education, University of California, Berkeley, Calif.

Training in Industry, Charles Ricketson Allen, consultant in industrial education, Dunwoody Institute, Minneapolis, Minn.

In the first issue of the magazine, announcing plans for the year's operations, Dr. Snedden, as editor-in-chief, wrote: "For several years the members of the National Society for Vocational Education have desired to establish a journal devoted exclusively to the interests of special education for vocations other than the professions. Such a journal is greatly needed. . . . An organ of intercommunication among all these interests in vocational education is an urgent necessity. . . . Eventually, every considerable field of education should have its own journal. . . . The existence of a journal devoted especially to vocational education is peculiarly justified by the very promising outlook for increased public support, promotion, and control of such education."

Publication Problems

The magazine encountered serious difficulties almost from the beginning. It seems as if the difficulties might have been foreseen, considering the depth of penetration and keenness of analysis brought to bear by the leaders on the many problems of the new movement for vocational education. In retrospect, it was comparatively easy to understand why such a journal would be well-nigh impossible to maintain under the given conditions.

The first eye opener was the discovery that the number of persons vitally interested in the general or over-all problems of the vocational education movement was far from large enough, and was not likely ever to be large enough, to support such a magazine through the medium of annual subscriptions. The number of individuals actually concerned with such over-all problems is strictly limited to a few members of the staffs of certain agencies of the Federal Government, in Washington, supplemented by the state superintendents of public instruction, the state directors of vocational education, and limited numbers of the members of the staffs of these officials, in the 48 states. In addition, a few leading members of the faculties of the larger universities, colleges, and teachers colleges, might be counted upon. All told, these and a few others added up to no more than a few hundred, instead of the thousands of subscribers needed for the support of such a journal.

The second difficulty arose from the nature of the contents of the magazine. The composition of the editorial staff recognized six special classes of readers to be served, and to these might well have been added *Guidance, Rehabilitation of the Handicapped, Evening Schools, Correspondence Schools*, and perhaps others. Here indeed was great diversity of interest and need, in many instances with little if any overlapping. It is not in accordance with the known traits of human nature to expect individuals in large numbers, and more especially from among low-salaried school teachers, to continue to pay a substantial annual subscription fee for a journal which undertakes and agrees to devote not more than one fifth to one sixth of the contents of each issue to the questions and problems that concern the individual subscriber!

At the annual convention of the National Society held in Des Moines, Iowa, in December, 1925, matters were brought to a head by the report of the Executive Committee, which declared that one of the outstanding problems facing the Committee and the Society was the publication of the *Vocational Education Magazine*.[1]

The Committee recognized the existence of a strong sentiment among the members of the Society for the continuance of the publication of the magazine, provided means could be found for adequately financing it. To this end a special campaign was undertaken to add new subscribers. The National Association of State Directors of Vocational Education made a very thorough and aggressive subscription campaign, the result of which was a substantial number of new subscribers. Unfortunately, however, "the number of those who failed to renew their subscriptions was so large as to nullify much of the effectiveness of the campaign."

The report of the treasurer showed that, beginning with September, 1924, the magazine was published at an average monthly deficit of more than $600. "It was recognized by the members of the Executive Committee, and by many others with whom the members of the Committee consulted, that a continuance of the magazine under prevailing arrangements would not only exhaust all the funds of the Society, but would in addition create an indebtedness that would be difficult to meet." The Committee recommended the discontinuance of the magazine with the issue of January, 1925, after two and one-half years of publication, and this recommendation was adopted by the Society and carried into effect.

The problem of financing a journal devoted to such diversity of interests as those represented in the vocational education movement was not solved until appropriate action was taken

[1]Report of the Executive Committee, National Society for Vocational Education, December 4, 1925, published in the Quarterly *News Bulletin*, Vol. 1, No. 1, Feb., 1926, p. 5

by the American Vocational Association, which was formed by a merger of the National Society for Vocational Education and the Vocational Education Association of the Middle West at a convention held in Louisville, Ky., in December, 1926. The newly organized Association adopted the policy of increasing the annual membership dues by an amount sufficient to underwrite the cost of publishing the *AVA Journal*. With an assured list of subscribers equal to the Association membership, and with provision in the budget of an amount sufficient to meet the cost of publication, when supplemented by income from advertising, the *Journal* was thereafter furnished without additional charge to all paid-up active members.

Summary

David Samuel Snedden was born in Havilah, Kern County, Calif., on November 19, 1868, and died at his home in Palo Alto, on December 1, 1951, at the age of 83 years.

His educational and professional preparation for his career as a teacher may be outlined as follows:

Entering St. Vincent's College, Los Angeles, in the spring of 1887, he was awarded the A.B. degree in June, 1889.

From 1895–97, he was a student at Stanford University, Palo Alto, Calif., where he received the A.B. degree in June, 1897.

One year, 1900–01, was spent in graduate study at Teachers College, Columbia University, New York City, at the close of which he received the A.M. degree, June, 1901.

Two years, 1905–07, were spent in graduate study at Teachers College, at the close of which he received the Ph.D. degree, June, 1907.

Following is a condensed outline of the teaching and administrative positions held:

His teaching career began with one year, 1889–90, in an ungraded school in Fairview District, Ventura County, Calif. This was followed by one year, 1890–91, as teacher of an ungraded school in Fillmore, after the close of which, in May, 1891, he taught two months in Santa Paula, completing the term for a teacher who resigned because of illness.

Four years, 1891–95, were spent in Santa Paula, the first year as principal of the elementary school, and the remainder as principal of the Union High School.

For three years, 1897–1900, he served as principal of the high school and superintendent of schools in Paso Robles.

For four years, 1901–05, he served as instructor (one year) and assistant professor of education, Stanford University.

For nearly four years, October, 1906, to January, 1910, he was adjunct professor of school administration, at Teachers College, Columbia University, New York.

From January 15, 1910, to July 1, 1916, he served as Commissioner of Education, State Department of Education, Boston, Mass.

From July 1, 1916, to the date of his retirement, July 1, 1935, he held the position of professor of educational sociology and vocational education, at Teachers College, New York.

From July, 1935, until the time of his death in 1951, he made his home in Palo Alto, Calif.

It may be added that Dr. Snedden was a member of Phi Beta Kappa, international honor society; and of Phi Delta Kappa, national honorary graduate fraternity in Education.

Project Design for Teachers

ALEXANDER F. BICK

Milwaukee, Wis.

(Continued from page 230 of the September, 1953, issue)

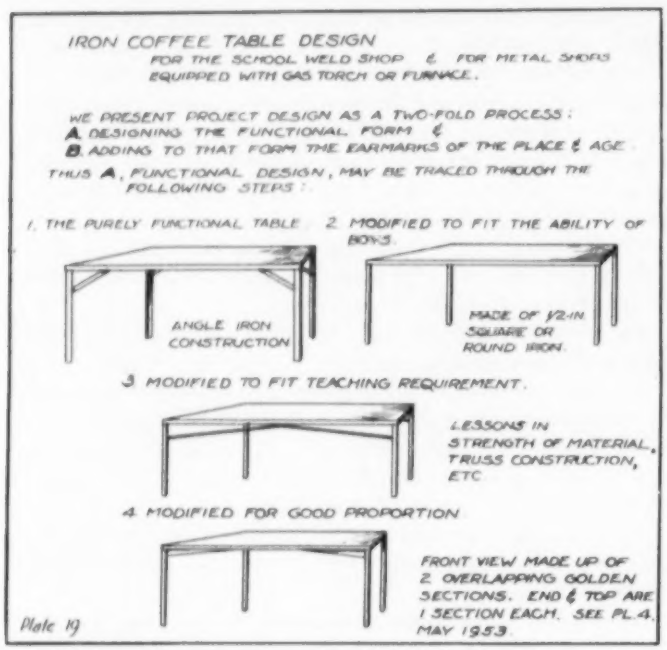
This article is directed toward weld-shop and metal-shop design, with emphasis upon the problems of commodity production.

The second article on *Project Design for Teachers*, published in the June, 1953, issue of this magazine, gave a simple method for finding *ideas* on design in source magazines. As a matter of principle, project designs should not be copied. Each design should be freely created for the need, the boy, the place, and the time. This we tried to illustrate in previous articles. It is indeed servile to copy, and the practice kills invention and produces a psychological letdown in the person who takes another's work for his own. The taker forgets that he has in himself the rich potential of a creator.

One of the values of the contemporary style is its newness and freedom from the need to copy. All traditional work is copy work. "But how," says the teacher, "can I design my own projects freely without training?"

It is the aim of these articles to show him that he can train himself by establishing contacts with professional know-how sources. See page 188 of the June, 1953, copy of INDUSTRIAL ARTS AND VOCATIONAL EDUCATION.

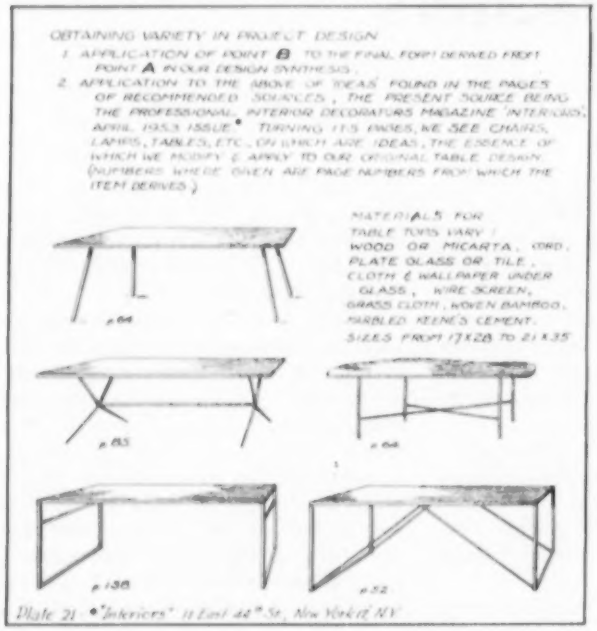
Schools preparing industrial arts and vocational education teachers have done little up till now to train the shop teacher in this important department; and design is important if for no other reason than that it confronts and challenges everyone in some form throughout the waking hours of his life. When he looks at nature he sees it 100 per cent perfect, and when he turns to the works and cities of man he sees it more than 90 per cent decadent. All the more important it is

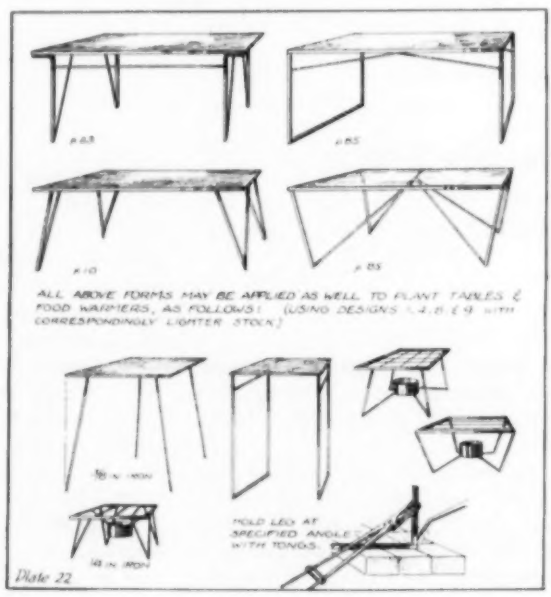

IRON COFFEE TABLE DESIGN
FOR THE SCHOOL WELD SHOP & FOR METAL SHOPS EQUIPPED WITH GAS TORCH OR FURNACE.
WE PRESENT PROJECT DESIGN AS A TWO-FOLD PROCESS:
A. DESIGNING THE FUNCTIONAL FORM &
B. ADDING TO THAT FORM THE EARMARKS OF THE PLACE & AGE.
THUS A, FUNCTIONAL DESIGN, MAY BE TRACED THROUGH THE FOLLOWING STEPS:
1. THE PURELY FUNCTIONAL TABLE.
2. MODIFIED TO FIT THE ABILITY OF BOYS.
ANGLE IRON CONSTRUCTION
MADE OF 1/2-IN SQUARE OR ROUND IRON.
3. MODIFIED TO FIT TEACHING REQUIREMENT.
LESSONS IN STRENGTH OF MATERIAL, TRUSS CONSTRUCTION, ETC.
4. MODIFIED FOR GOOD PROPORTION
FRONT VIEW MADE UP OF 2 OVERLAPPING GOLDEN SECTIONS. END & TOP ARE 1 SECTION EACH. SEE PL. 4, MAY 1953.
Plate 19

AND B. ADDING TO FUNCTION (ABOVE) THE MARK OF THE AGE.
THUS THE 2ND OF THE TWO PROCESSES IS IN REALITY A REVISING OF THE PRODUCT OF THE FIRST STEP CAUSING IT TO REFLECT THE PERSON, PLACE, & AGE — OR JUST THE AGE — THE AIR AGE.
FOR EXAMPLE: WERE BOTH ABOVE PROCESSES, A & B, APPLIED TO THE DESIGN OF A CAR, WE MIGHT ARRIVE AT THE FOLLOWING:
A. FUNCTIONAL DESIGN (ENGINEERING) CHASSIS, MOTOR, TRANSMISSION, WHEELS, ETC.
B. ART: FITTING THE ABOVE TO THE AGE.
THUS, THOUGH BOTH CARS ARE POWERED TO RUN AT FROM 10 TO 120 MPH ONLY THE SECOND FITS THE CONCEPT OF THE AGE.
YOU ASK, "WHAT IS THE ESSENCE OR MARK OF THE AIR AGE?" AND OUR ANSWER IS
1. LIGHTNESS OF STRUCTURE: AIRY,
2. SIMPLICITY, CLEANNESS OF SPACE & LINE.
3. ABSENCE OF DETAIL, SERENITY, HONESTY.
4. OFF-THE-GROUND QUALITY.
5. LINES OF MOVEMENT THROUGH SPACE & TIME.
WHEN FORM THUS BECOMES SYMBOL OF NEW CONCEPTS IT TAKES THE NAME CONTEMPORARY DESIGN.
Plate 20

that we teach excellence in design in every school of our nation so that our cities and highways be redeemed from their senseless ugliness. Then children will be given a new pattern, and they will not be part of the condonation and lethargy that maintains the status quo in this age of scientific wonder.

It seems strange that so many in the teaching profession are afraid of the word *design*. Would that there were genial and understanding artists who might sit with you in the shade of a campus tree to show you that perhaps your general reticence with regard to design resulted not from subject matter but from misguided training in early life, when as a little child you drew naturally and freely until someone ignorant of the psychology of a child said the critical thing that killed the flow of childish happiness in free expression. Now as a man, you are still confused and you say, "It makes no sense, it is too deep; it is not realistic." On the contrary, when these barriers are removed, you will become inherently a designer, and actually exercise your capacities unconsciously. However, make a small investment in time and attention and you will recapture the essence of design as synthesized in the three previous and the present articles. Each time, the formula has been identical though applied to unrelated project categories. In this issue the formula is applied step by step in two primary divisions to welded or brazed iron tables. If an arc or acetylene torch is not available, a gas torch or furnace with a brazing area well enclosed in brick or iron sheet is very


OBTAINING VARIETY IN PROJECT DESIGN
1. APPLICATION OF POINT B TO THE FINAL FORM DERIVED FROM POINT A IN OUR DESIGN SYNTHESIS;
2. APPLICATION TO THE ABOVE OF "IDEAS" FOUND IN THE PAGES OF RECOMMENDED SOURCES, THE PRESENT SOURCE BEING THE PROFESSIONAL INTERIOR DECORATORS MAGAZINE "INTERIORS," APRIL 1953 ISSUE.* TURNING ITS PAGES, WE SEE CHAIRS, LAMPS, TABLES, ETC., ON WHICH ARE IDEAS, THE ESSENCE OF WHICH WE MODIFY & APPLY TO OUR ORIGINAL TABLE DESIGN. (NUMBERS WHERE GIVEN ARE PAGE NUMBERS FROM WHICH THE ITEM DERIVES.)
MATERIALS FOR TABLE TOPS VARY: WOOD OR MICARTA, CORD, PLATE GLASS OR TILE, CLOTH & WALLPAPER UNDER GLASS, WIRE SCREEN, GRASS CLOTH, WOVEN BAMBOO, MARBLED KEENE'S CEMENT. SIZES FROM 17X28 TO 21X35
p. 64
p. 85
p. 64
p. 138
p. 52
Plate 21 *"Interiors" 11 East 44th St., New York 17, N.Y.


p. 83
p. 85
p. 10
p. 85
ALL ABOVE FORMS MAY BE APPLIED AS WELL TO PLANT TABLES & FOOD WARMERS, AS FOLLOWS: (USING DESIGNS 1, 2, 8, & 9 WITH CORRESPONDINGLY LIGHTER STOCK)
HOLD LEG AT SPECIFIED ANGLE WITH TONGS.
Plate 22

successful, using Handy & Harmon's flux and their Ezyflo brazing wire applied at red heat.

Finally, it may be well to consider the thought that projects with meaning to the boy might benefit his spirit. The techniques required in the fabrication of iron furniture will inject variation into his experience, will teach him the problems of a sizable commodity industry, and will show him the principle of truss construction firsthand.

UNIT TEST ON AUTOMOBILE RADIOS

J. L. MURRY

Associate Professor and Chairman of the Department of Electrical Industries
Southern University
Baton Rouge, La.

Name.....

Date.....

True — False

Directions: In the following statements, indicate the word *true* or *false* in the space provided.

.... 1. Generator interference may be recognized by a rather high-pitched whine.
.... 2. The standard remedy for generator interference is to connect a condenser from the hot side of the generator to ground.
.... 3. Wheel or tire static shows up generally on very wet days and is caused by friction of tires on the road.
.... 4. Very low or zero voltages at both plates of the rectifier tube, points to trouble in the transformer, probably the primary.
.... 5. Some manufacturers have designed aerials which may be raised or lowered by operating a control inside the car.
.... 6. Hash is a form of interference that may persist when the antenna is disconnected from the set and the antenna terminal grounded.
.... 7. To prevent engine ignition interference from being carried outside the engine compartment it is good practice to ground all metal rods like tubing, steering column and choke rod which passes through the bulkhead.
.... 8. Interference caused by the ignition system produces a ticking sound.
.... 9. The 80 and *6 x 5* are good rectifier tubes for the car receiver.
.... 10. Car receivers must be rigged and the components must be able to withstand the effects of changes in temperature and humidity.
.... 11. The synchronous vibrator uses a OZ4, 6 x 5 or equal as a rectifier tube.
.... 12. Excessive hum in a car receiver may be caused by excessive current drain or shorted by pass condenser.
.... 13. The value of the buffer condenser is closely related to the vibrator frequency.
.... 14. Intermittent operation is most likely to show up when traveling over rough roads.
.... 15. The two general types of vibrator circuits are the shunt coil type and the series coil type.
.... 16. A vibrator cannot produce a frequency over 60 cycles per second.
.... 17. The automobile radio should be connected through the ammeter to the battery.
.... 18. A defective vibrator can be easily repaired.
.... 19. The voltage ratings of the filter condensers are usually higher in the automobile radio, and lower in the home receiver.
.... 20. The 84 and *6 x 5* rectifiers are designed to operate on 5 volts.

Multiple Choice

Directions: In the following statements underline the correct answer, and write the letter corresponding to it in the space provided.

Example: The mean is a measure of (*a*) correlation, (*b*) central tendency, (*c*) variability, (*d*) Rann, (*e*) validity. (*b*)

( ) 1. The maximum frequency that a vibrator can produce is (*a*) 20 cycles per second, (*b*) 60 cycles per second, (*c*) 135 cycles per second.
( ) 2. A disadvantage of the under car antenna is that it is subject to (*a*) burn out the ammeter, (*b*) rust or corrosion, (*c*) defect the vibrator.
( ) 3. The best antenna to use for a car receiver is the (*a*) trunk lid antenna, (*b*) car top antenna, (*c*) vertical rod antenna, (*d*) under car antenna.
( ) 4. The remedy for wheel static is to install a (*a*) interference suppressor, (*b*) static collector, (*c*) new vibrator, (*d*) buffer condenser.
( ) 5. The class *B* output stage is installed in some cars to obtain (*a*) increased power *output*, (*b*) better R.F. gain, (*c*) low power *output*, (*d*) oscillation.
( ) 6. Which two tubes are used as class *B* twin triodes in the output stage of a car radio, (*a*) 7A7 and 7B8, (*b*) 6N7 and 6A6, (*c*) 6Sk7 and 125K7.
( ) 7. A normal battery drain is (*a*) 9 to 10 amps, (*b*) 10 to 12 amps, (*c*) 6 to 8 amps.
( ) 8. Future troubles in a vibrator can be determined by using what piece of test equipment: (*a*) signal generator, (*b*) oscilloscope, (*c*) tube tester.
( ) 9. A common working voltage for buffer condensers is (*a*) 600 volts, (*b*) 1600 volts, (*c*) 2600 volts.
( ) 10. With a synchronous vibrator, one must (*a*) clamp the vibrator in place, (*b*) use two buffer condensers, (*c*) observe proper polarity.

Matching

Directions: In the parentheses at the left, place the letter of the word or words from the table found at the end of the *matching* test questions, that it most accurately describes.

( ) 1. Synchronous vibrator
( ) 2. Nonsynchronous vibrator
( ) 3. Buffer
( ) 4. Output tube
( ) 5. Cold-cathode rectifier
( ) 6. Two general types of vibrator magnet coils
( ) 7. Tire static generally shows upon
( ) 8. Tube unsuitable for auto radio
( ) 9. "Whip" antenna
( ) 10. Weak signal; noisy reception

A. Uses a rectifier tube
B. 5Y3
C. Dry days
D. Antenna
E. Vertical rod
F. 6SA7
G. 6V6
H. Condenser
J. Self-rectifying
K. 0Z4
L. Wet days
M. Defective antenna
N. Shunt coil and series coil

Completion

Directions: In each sentence, fill in the blank with word necessary to complete the sentence.

1. A car receiver may use both the locking type tube as well as the ..... type tube.
2. The four major components of the nonsynchronous vibrator power supply are ....., ..., ..., ...
3. The operating principle of a vibrator is similar to that of the ordinary doorbell or .....
4. The synchronous vibrator is ..... therefore it uses no tube.

(Continued on page 69)

INDUSTRIAL ARTS and VOCATIONAL EDUCATION

JOHN J. METZ, Editor

THE AMERICAN INDUSTRIAL ARTS CONVENTION

J. Lyman Goldsmith, local convention committee chairman for the American Industrial Arts Association convention which is to be held in Los Angeles, Calif., March 22 to 27, 1954, invites all AIAA members to attend seven days of outstanding discussion on industrial-arts education.

His committee has worked hard to make this an outstanding meeting. They have chosen the Statler Hotel as headquarters.

Instructors in institutions preparing industrial-arts teachers, state and city supervisors of industrial arts, and industrial-arts teachers should plan to attend this important gathering.

On Monday and Wednesday there will be visits to local schools and industrial plants.

On both Tuesday and Wednesday, the American Council on Industrial Arts Teacher Education, and the American Council of Industrial Arts Supervisors will hold general group meetings.

At the general meeting on Wednesday afternoon, Dr. John R. Ludington, Specialist for Industrial Arts in the U. S. Office of Education, and Dr. R. Lee Hornbake, Professor of Industrial Arts, University of Maryland, will present the main addresses.

The Alpha-Beta Chapter of the industrial-arts department at Santa Barbara College will conduct an initiation on Saturday. The college industrial-arts department shops and classes will be in session. There also will be a noon luncheon and an evening barbecue on the college grounds.

Naturally, there will be a commercial exhibit, and from all indications it will be the largest in the history of the associations.

And then there will be that famous California weather. Be sure to attend the 1954 AIAA convention — it will be a pleasant and an educational treat.

FIRE HAZARDS

The new year has just started and it is well to look back over 1953 and forward to what 1954 will bring.

Safety is one of the things that is of special concern to everyone, and one of the most appalling dangers that must be guarded against in any year is that of fire.

"Facts and Trends," a periodical published by the National Board of Fire Underwriters, estimates that the fire losses for the past year were forty thousand dollars higher than in the previous year. This estimate was based on the average increase (17 per cent) in fire losses for the first nine months of 1953.

The estimated fire loss for the entire year of 1953 was set at $925,000,000. This tremendous loss is due to the more than a million fires of all sizes — small ones due to the ignition of small piles of rubbish and large fires which raze dwellings, public buildings, and industrial plants.

Besides this predicted huge fire loss, one must take into account that approximately 11,000 persons will have lost their lives, and many more will have been injured as a result of the fires.

Many of these fires could have been avoided if proper care had been given to common safety measures. This should be especially significant to shop teachers. There are many fire hazards in the school shop. It is well to have them in mind, and plan preventive measures to make it impossible for a fire to be started.

Special care must be given to the storage of wood, paints, oils, flammable liquids and their gases, accumulations of sawdust, shavings, and oily rags.

But the woodworking and finishing areas in the shop are not the only danger points. The machine shop might seem a fairly safe place, but even there, safety cautions must be observed, especially if soldering, forging, welding, cutting, and hardening and tempering operations are performed there.

The auto-mechanics shop has additional fire hazards which must be guarded against, as has also the print shop.

Be doubly careful to impress upon the students the danger of smoking and using matches in the shop. Of course, there are strict rules against smoking in the school, but even teachers fail to observe these rules from time to time.

Against fire, the only weapon is preparedness and eternal vigilance. Remove every chance for a fire to get started, and keep your fire extinguishers handy and in good condition.

SOMETHING FOR THE SHOP TEACHER TO REMEMBER

A survey reported by Williard A. Kerr, associate professor of psychology, and Frank J. Smith, graduate student, both of the Illinois Institute of Technology, Chicago, Ill., shows that the most important sources of quitting employee grievances have something to do with the worker's pay or with his foreman's supervision.

The survey was based on the results of questionnaires received from exit interviewers at 48 companies who interview over 5000 quitting cases annually.

This survey shows that almost two out of every five reasons for quitting involved pay. Next in frequency were transportation, promotion, working conditions, poor health, disagreement with the foremen, and job security.

An employee living at a great distance from his plant naturally has transportation difficulties and his foreman will soon put the employee into the class of the *less dependable*. The worker resents this and will lose confidence in the ability of his foreman as a supervisor.

Questions of this kind may well be brought up in class discussions.

Students will be able to tell of many friends who live far from their work. Some of them have transportation problems, while others have worked out a solution by arising earlier and starting for the plant with ample time to get there before the starting signal is given.

These discussions may set the students to thinking of what is expected of them on a job, and get started in the establishment of habits that may smooth out his future working troubles.

The same reasoning may also cause some of the tardiness at the school to be cut down. The disease of tardiness must be tackled early in life, or youth may have many frustrations during the school-to-work adjusting period.

PROBLEMS AND PROJECTS

WASTEBASKET WITH NOVEL CONSTRUCTION

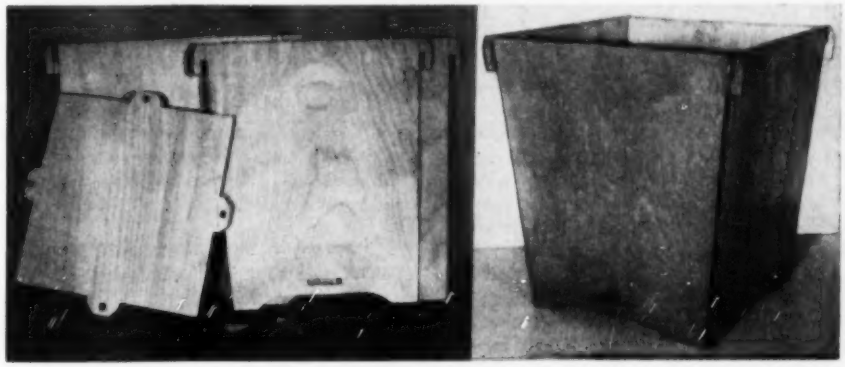
DICK HUTCHINSON
San Gabriel, Calif.

The wastebasket shown and described herewith locks together with four pegs. It may be made on the jig saw, and can be completed in one evening.

We suggest ¼-in. birch plywood to eliminate splintering in the process of sawing out, and because this fine grain wood takes such a beautiful finish.

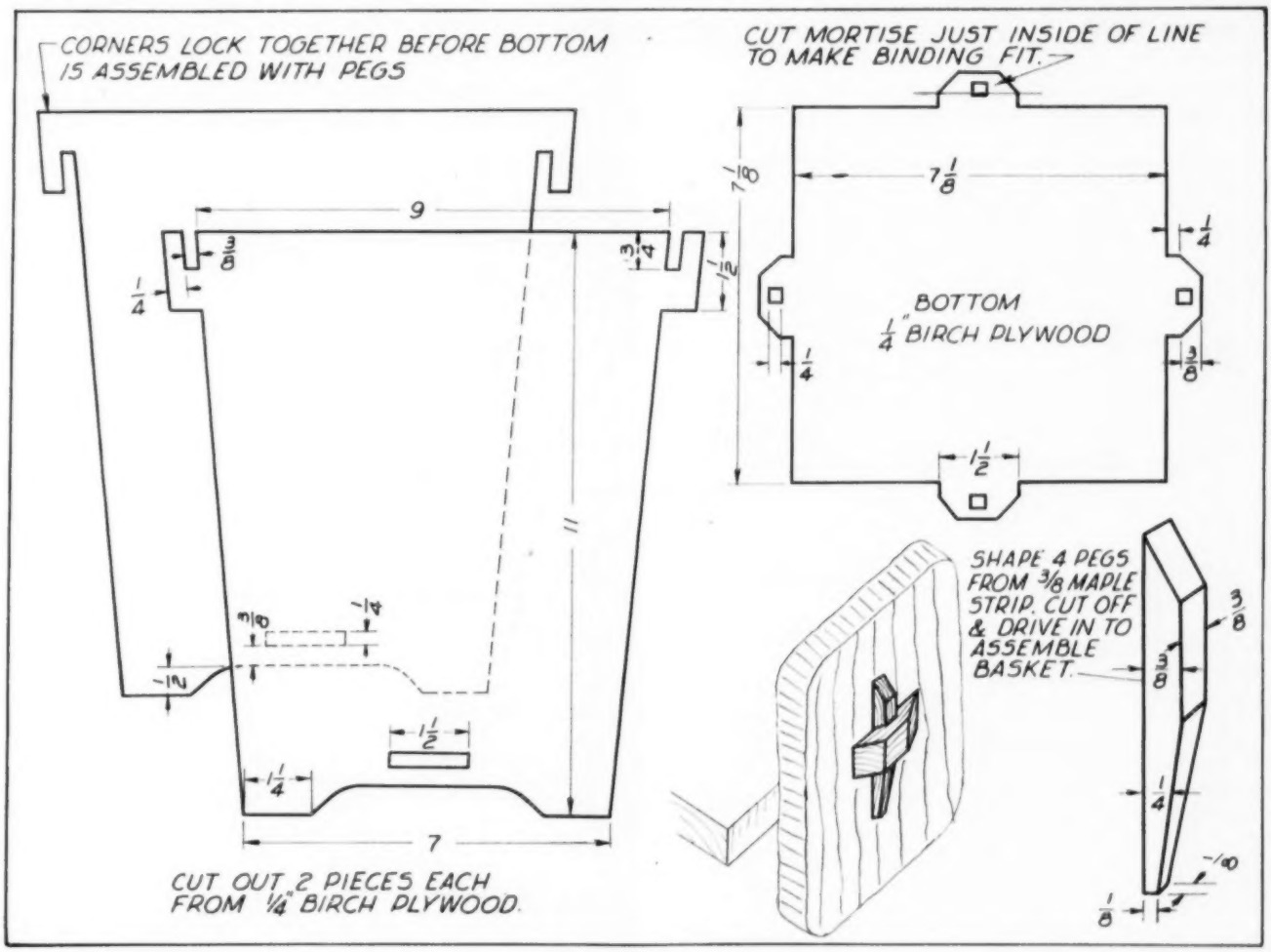
Lay out the four sides on the ¼-in. birch plywood. It will be noted that in cutting the ears, two are cut with the openings for locking cut in the top of the ear, while the other two are cut in the bottom.

Drill and jig-saw out the ¼-in. mortises at the bottom of each piece, and square up evenly with a file.



At left — All of the parts for the basket finished in antique and ready to assemble. At right — Assembled wastebasket

Lay out and cut the bottom piece from the same material. Drill ¼-in. holes as indicated, and square up with a ¼-in. square file, then shape the four maple pegs as shown, and cut


CORNERS LOCK TOGETHER BEFORE BOTTOM IS ASSEMBLED WITH PEGS
CUT MORTISE JUST INSIDE OF LINE TO MAKE BINDING FIT.
9
7 1/8
BOTTOM
1/4" BIRCH PLYWOOD
SHAPE 4 PEGS FROM 3/8 MAPLE STRIP. CUT OFF & DRIVE IN TO ASSEMBLE BASKET.
7
CUT OUT 2 PIECES EACH FROM 1/4" BIRCH PLYWOOD.

Details of wastebasket construction

to size. Assemble the basket temporarily to make sure that it fits together perfectly, then take apart and, using fine garnet paper sand to a scratchless finish all over, after which each piece should be given an even coat of white shellac and set aside to dry.

The shellac brings out all of the beauty of the lines in the wood and results in a beautiful blonde finish if such a finish is desired; however, to obtain that very popular antique maple finish proceed as follows.

Put a little light brown semigloss oil paint into a tray, and into this mix brilliant red enamel until the color leans slightly toward the red. Paint this over all surfaces of each piece and wipe dry with a soft cloth. The results will closely resemble the finish the early Americans produced on maple furniture.

To assemble, lock the ears of the four sides together. Set the bottom in and drive the four pegs in tight, resulting in a wastebasket that will not come apart, and one that is attractive enough to be used along with the finest furniture.

TWO SHOP KINKS

C. WAYNE CLOSE
Glendale, Ore.

When handling brazing and welding flux around the shop, spillage and loss of box lids is always a problem. To obviate these troubles, remove the lid from a new can of flux and cut a hole in the center about the size of a quarter. Take a piece of metal from another tin can and solder it into an open cylinder slightly larger in diameter than the hole in the lid. The length should be about half the depth of the flux box. Solder one end of the cylinder around the hole on the underside of the lid. Put the lid back on and solder it shut. Even when this box is overturned, very little flux will spill out. The flux will always be clean and ready for use.

Improving the Cutting Compound

A cutting compound superior to the usual cutting oil can be made by adding about 25 per cent carbon tetrachloride to regular cutting oil. This makes a superior fluid for drilling and threading in hard steel.

SPOON HOLDER

OSCAR A. EMBRETSON
and
FRED G. WENTORF
Vocational and Adult School
Racine, Wis.

The reason for selecting a given project depends on two things: (1) what learning value has it, and (2) what is its take home appeal.

The spoon holder is planned for junior high school level or 14- to 18-year-old vocational school students.

Most mothers have one time or another collected souvenir spoons while on a vacation tour only to let them accumulate in a drawer because of not having a suitable display holder. Then, too, most mothers like house plants in one form or another. Together, these two make up the take home appeal of this spoon holder.

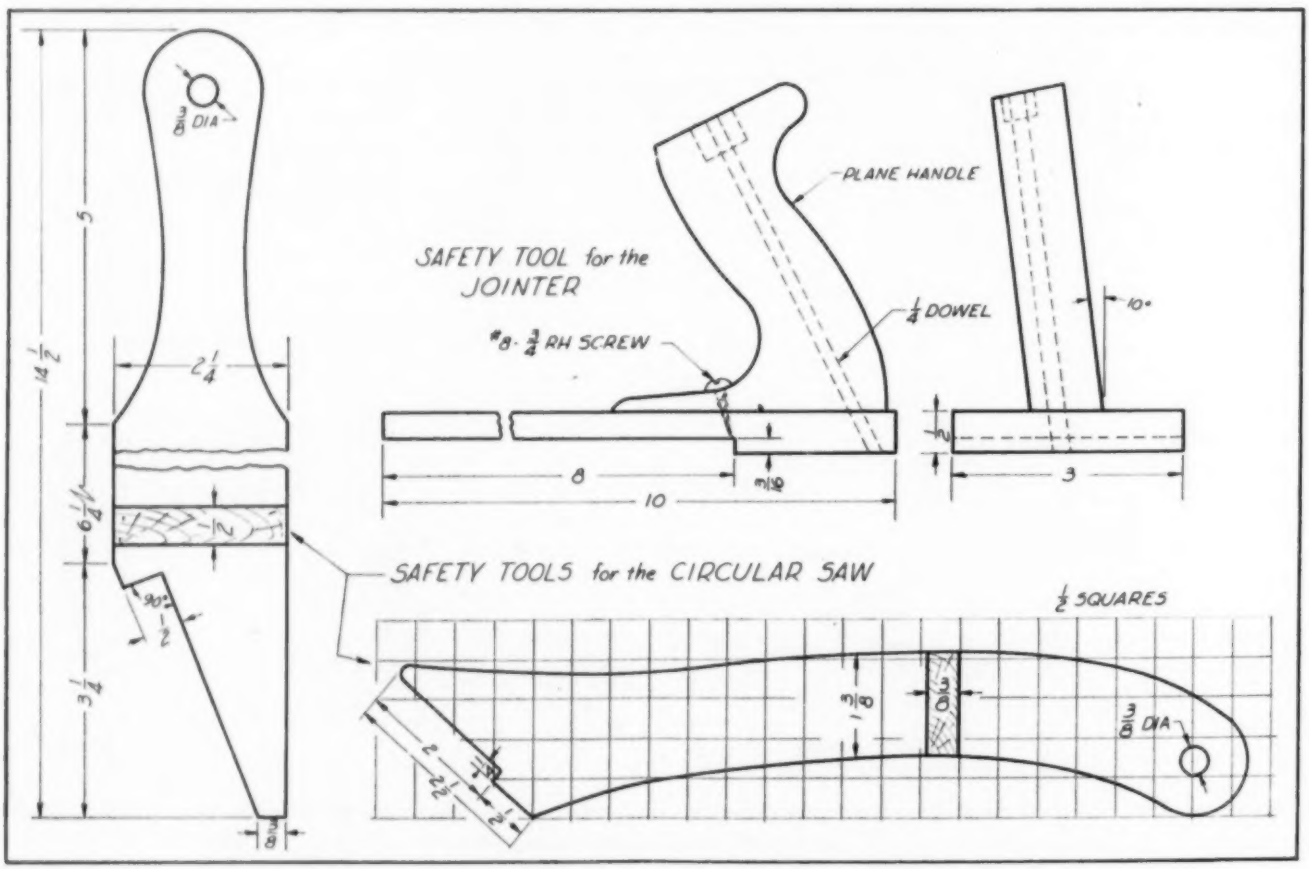
The construction is elementary, yet making this project combines in what the student should know and what he should be able to do.

Spoon holders were as much a part of household furnishings during George Washington's days, as television is in our household today. Some were designed to hold the sugar and cream holder which was generally displayed in the dining room.

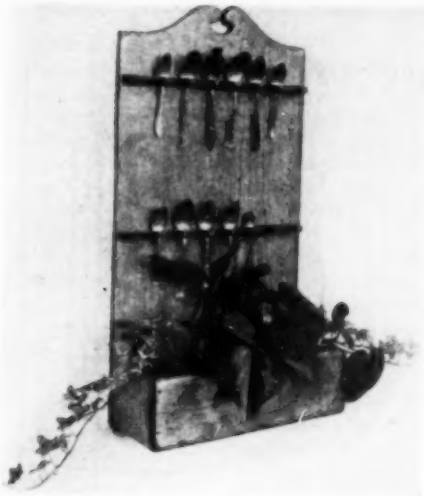
The flower box herein shown can be used for planting ivy or any foliage which may be desirable for a dining room.

This project is easy to construct, yet it offers a good opportunity for modification of design.

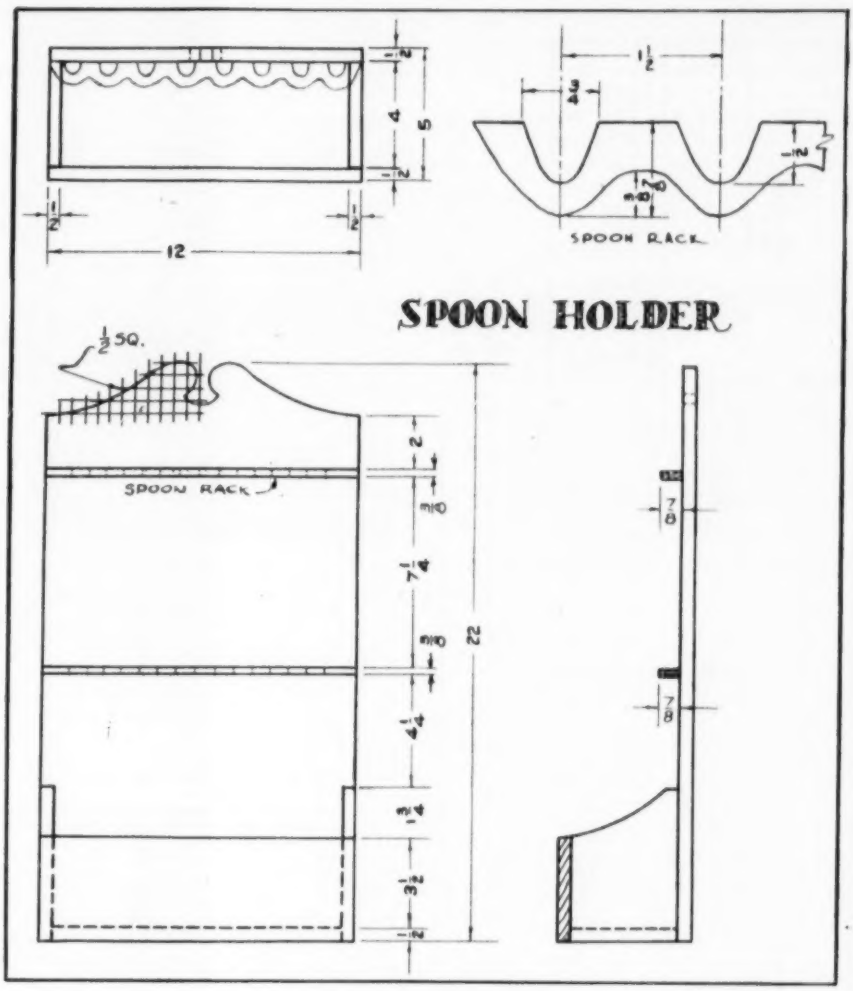
When finished in a colonial maple and filled with your prized spoon collection together with a Boston ivy in the box, it will be most attractive in any home.



Push sticks for circular saws and jointers by Louis Barocci, High School, Cudahy, Wis.



Spoon holder



Details of spoon holder

BILL OF MATERIAL

Pieces Required	*Name*	*Stock*	*Size*
1	Back	Maple	½ x 12 x 22
1	Front	Maple	½ x 3½ x 12
1	Bottom	Maple	½ x 4 x 11
2	Ends	Maple	½ x 4 x 5¼
2	Spoon racks	Maple	⅜ x ⅞ x 12
1	Galvanized iron or tin box made of 28-ga. metal, with a width of 3⅞ in., 2¾ in. deep, and 10⅞ in. long. These are outside dimensions.		

Tools

Rule, square, smoothing plane, block plane, crosscut saw, ripsaw, coping saw, hammer, nail set, sandpaper.

Suggested Procedure

1. Study the working drawing.

2. Plane and square all pieces to the sizes in the bill of material except for the back and ends.

3. Glue several narrow boards together to make the back slightly wider than 12 in., and slightly longer than 22 in. A glued-up board this wide is less likely to warp than a one-piece board.[1]

4. Transfer the pattern for the top of the back to a piece of stiff cardboard. Cut out the pattern and transfer the design to the wood.

5. Saw out the design with a coping saw. File and sand all sawed edges.

6. With a tracing paper, transfer the pattern for the end to piece of stiff cardboard. Cut out using a scissors. Transfer the design to the wood.

7. Saw the end design with a coping saw. File and sand all sawed edges.

8. Transfer the pattern for the spoon holder to a piece of stiff cardboard, and cut it out using a razor blade and scissors. Transfer the design to the wood.

9. Saw the design with coping saw or jig saw. File and sand sawed edges..

[1]John L. Feirer, *Industrial Arts Woodworking*, pp. 72-81 (Peoria, Ill.: Chas. A. Bennett Co., 1950). Souvenir spoons from the collection of Mabel L. Embretson.

CAUTION: When filing support the workpiece with two pieces of wood in the vise. This will help prevent the workpiece from breaking.

10. Nail the flower box together using 1¼-in. No. 18 brads.

11. Assemble the spoon rack to the back using a No. 5b ¾ — f.h. screw.

12. Your sheet-metal department will make the metal box.

13. Provide a suitable method of hanging on the wall.

14. Give the spoon holder a suitable finish.

Study Questions

1. How many sixteenths in 1¾ inches?
2. Name the important parts of a smoothing plane.
3. List the steps in squaring up stock.
4. What is the bench hook?
5. Explain the reason for making the glue joint as you did.
6. Name three kinds of glue.
7. Give a few characteristics of maple.

PLASTIC MUSICAL NOTE SHELF

RAY C. DOANE
Industrial Arts Department
Ames Junior High School
St. Paul, Minn.

The plastic musical note shelf, shown in Figure 1, was designed for the boy or girl who is interested in music. Many boys and girls in junior and senior high school have developed sufficient interest in music to participate in musical activities in school and out of school. Extrinsic motivation for the manipulative activities necessary for the construction of the sixteenth note wall shelf should be minimized.

There are several possibilities for the use of the shelf in the home. The project can be placed very appropriately on the wall near a piano, radio, television set, phonograph, or other musical instruments. The shelves may be used for supporting small knickknacks and figurines. For an interesting variation, place

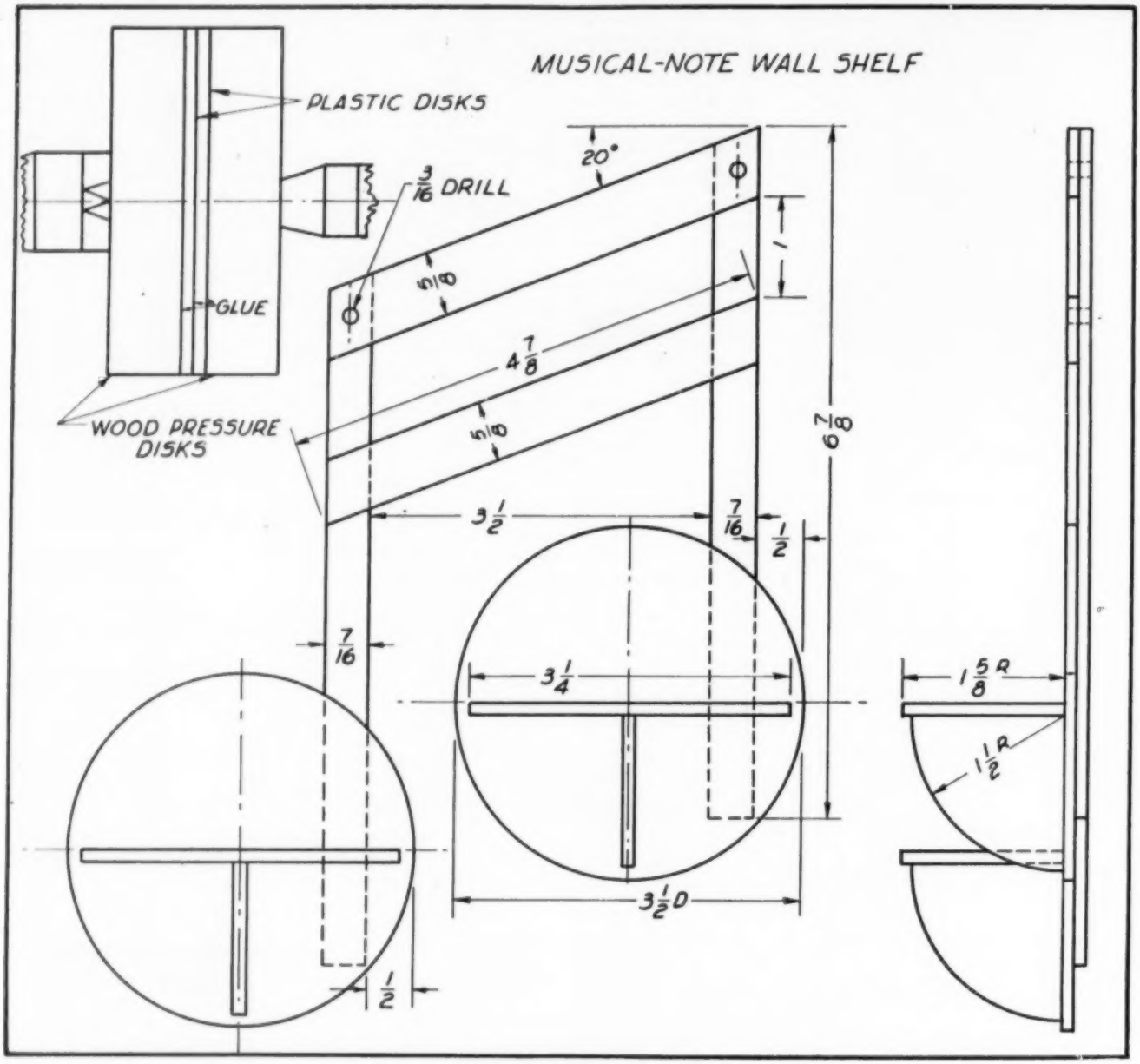


Fig. 2. Details of musical note shelf

on the shelves small vases containing hanging vines. Small leaf varieties of the ivy are particularly adaptable.

In the planning processes of this project, attention should be given to the color and thickness of the plastic material to be used. Since all the notes on the music staff are black, this is recommended as an appropriate color for materials. If certain factors preclude the use of black, other colors fitting the color scheme of the room are permissible. It is not advisable to select clear white plastic material. The thickness of the materials for the entire project is ⅛ in.

The plan of procedure for the construction of the musical note shelf follows:

1. Make full scale drawing.
2. Select appropriate color for materials.
3. Lay out all pieces.
4. Cut out pieces.
5. File edges.
6. Scrape edges.
7. Sand edges, if necessary.
8. Place pieces on plan for trial assembly.
9. Cement one shelf and brace to each note.
10. Cement ends of both bars to stems at correct angle.
    NOTE: Adjust a T bevel at 20° for a guide.
11. Locate centers of hang-up holes.
12. Drill 2 holes, 3/16-in. drill.
13. Prepare project for polish.
14. Wax and polish.

The disks used as the base of the notes can be cut out with a coping saw, jig saw, or a band saw. However, the matter of getting the disks perfectly circular may present a problem. After the disks have been cut out, it is suggested that they be placed in a lathe for turning as illustrated in Figure 2.

Glue should be placed on the *protective paper* of both faces of each plastic disk and the inside faces of the wood pressure disks; this assembly of disks needs to be clamped adequately. Allow sufficient drying time for the glue and mount in the lathe properly for turning. CAUTION! Do not attempt the use of the cutting method with a skew. Scraping is advisable with a 1-in. wood chisel, or wider, at slow turning speeds and with little pressure.

This operation will prove to be a fascinating experience for the boy or girl.

The technique of the hand scraping method is advocated highly for getting smooth edges of plastic materials; this is applicable for straight edges, regular curves, or irregular curves. After the saw marks have been removed with a file, the removal of file marks is necessary. These file marks can be removed rapidly and easily with proper use of a sharp, 3 by 5 hand scraper. Adjust the scraper at approximately 60° to the edge of the plastic to be scraped. The hand scraper may be pushed or pulled providing that the tool is slanted toward the direction of the scraping movement. Some attention needs to be given to the amount of pressure which is exerted on the scraper because too much pressure will result in removing material too rapidly. The student using too much pressure on the tool may, unknowingly, distort the lines of the design. With adequate instruction pertinent to the amount of pressure to be used, students may perform this operation with little difficulty.

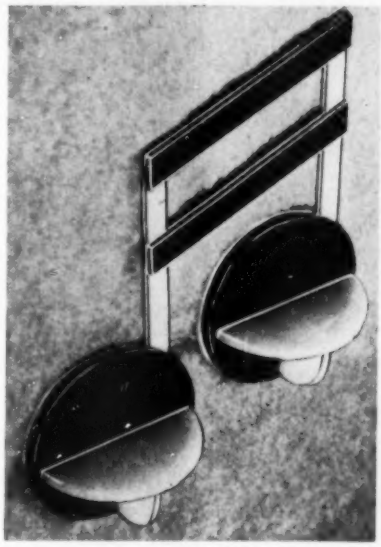


Fig. 1. Plastic musical note shelf

The plastic sixteenth note wall shelf involves a number of fundamental operations which are repeated frequently in a plastics area of an industrial-arts program. It is suggested that this project be placed with other projects having similar operations for the purposes of increasing the possibilities of selection related to the students' interests.

HOLDER FOR PAPER NAPKINS

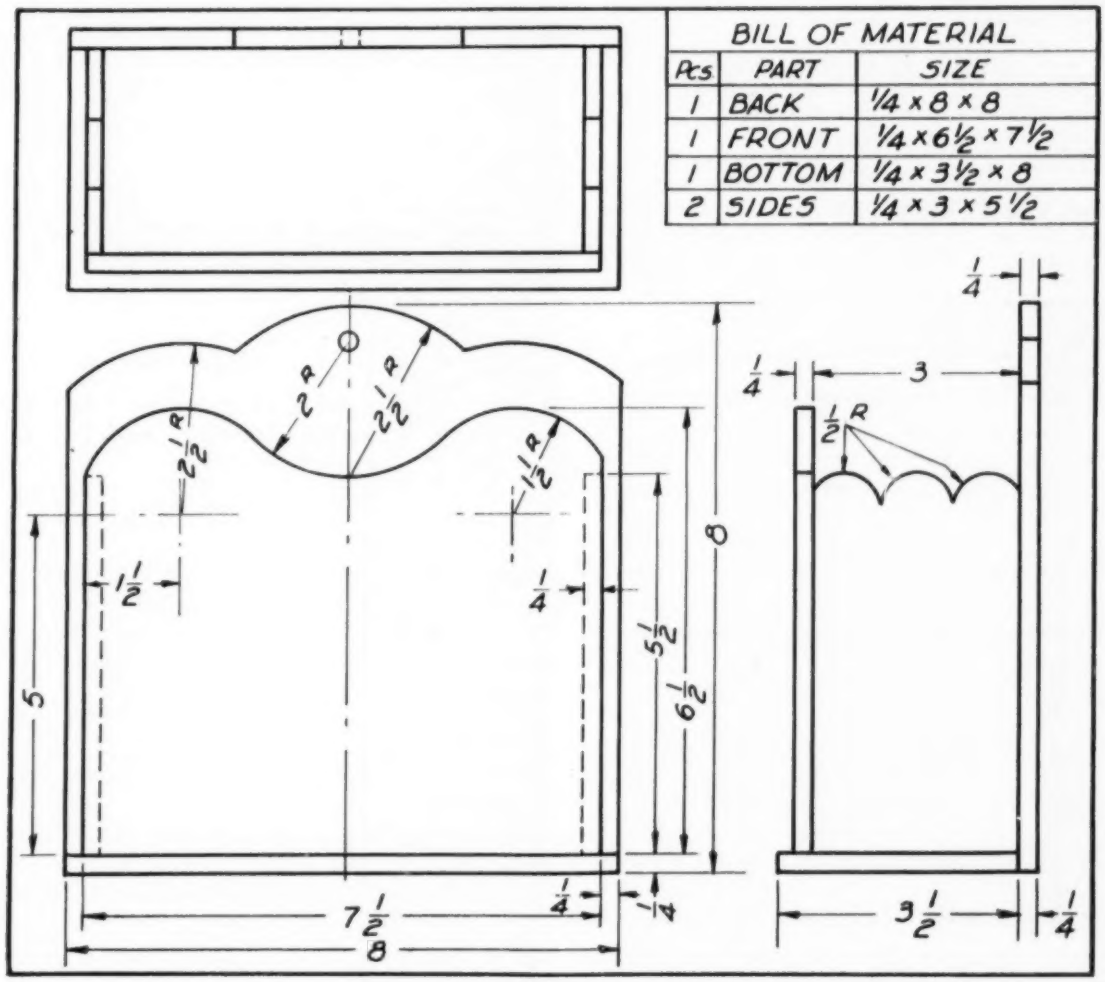
I. M. FENN
Chicago, Ill.

The holder for paper napkins described in this article can be made with a few scraps of wood, metal, or plastics. It is an attractive and useful item for the home.

This project gives the students valuable experiences in the use of tools and materials.

Directions

Study the drawing, especially the bill of



Details of the holder for paper napkins

material, and select all the necessary pieces of wood, metal, or plastics, depending upon your shop resources. Square, lay out, and shape the items as shown. Smooth and assemble with the fasteners commonly used with the specific material chosen. Finishes should also be selected in the same manner.

Some students may want to experiment by making the napkin holder out of a combination of materials. In this way, some individual differences are considered and inspired.

JAPANESE WOOD SHOES

CAPT. ROBERT W. INNIS
Ass't. Prof. of Science and Tactics
Michigan State College
East Lansing, Mich.

The Japanese wood shoes shown are typical of the old style shoes that are still considered popular and stylish in Japan. They owe most of their popularity to custom and low cost. They are cut in one piece from any kind of hardwood and are decorated with bright color such as Chinese red, pink, green, blue, etc. They are held on the feet by Y-shaped strings with one end worn between the large and second toe and the other two ends fastened on either side of the rear portion of the foot. The high steps on the bottom of the shoes are to keep the wearer's feet out of the mud and dirt of the many unpaved streets and roads of the country. The shoes are always removed before entering the house.

Japanese wood shoes of this type are valuable to teachers as actual samples to show classes studying Japan, or to serve as novelties or souvenirs of Japan.

Japanese wood shoes

The size of the shoe can be easily designed to fit any size foot.

MODIFIED PERIOD SEWING CABINET

THOMAS G. KING
Redford High School
Detroit, Mich.

Among the cosmopolitan high schools of Detroit, Mich., only Redford High School's Vocational Department, under the direction of Rudolph W. Gaerttner, has featured a series of woodworking courses which offer small furniture construction. The plan, originated by Mr. Gaerttner, has become so popular that it has been necessary to limit students to three semesters of work in the shop. The initial course is designed for students who have had little or no previous woodworking experience and teaches them the basic tool operations as well as basic procedures which are used in the more advanced classes devoted to small furniture construction such as is performed in the average home workshop.

Both period and modern styles of furniture are built by students in the advanced classes. The sewing cabinet was designed by the present instructor, Thomas G. King, to blend well with other period pieces that are currently popular with the students. The joinery, amount of work time involved, and the precision of workmanship required of the student are such that any second or third semester high school student should be able to complete the project in a single semester of twenty weeks in which five 90-minute periods per week are devoted to shopwork. This time allocation also provides for the application of a hand-rubbed satin finish.

The project may be broken into ten divisions of work which makes it possible for the student to be working on one division of the work while another may be held up in the assembly or gluing process. The following is a rudimentary breakdown of the job.

PROJECT SCHEDULE

A. *Legs*
1. Get out stock.
2. Square to size.
3. Lay out and cut taper.
4. Lay out and make joints
   a) Dowel
   b) Mortise

B. *Sides and Back*
1. Get out stock.
2. Glue up to rough width.
3. Square to size.
4. Lay out and bore dowel holes.

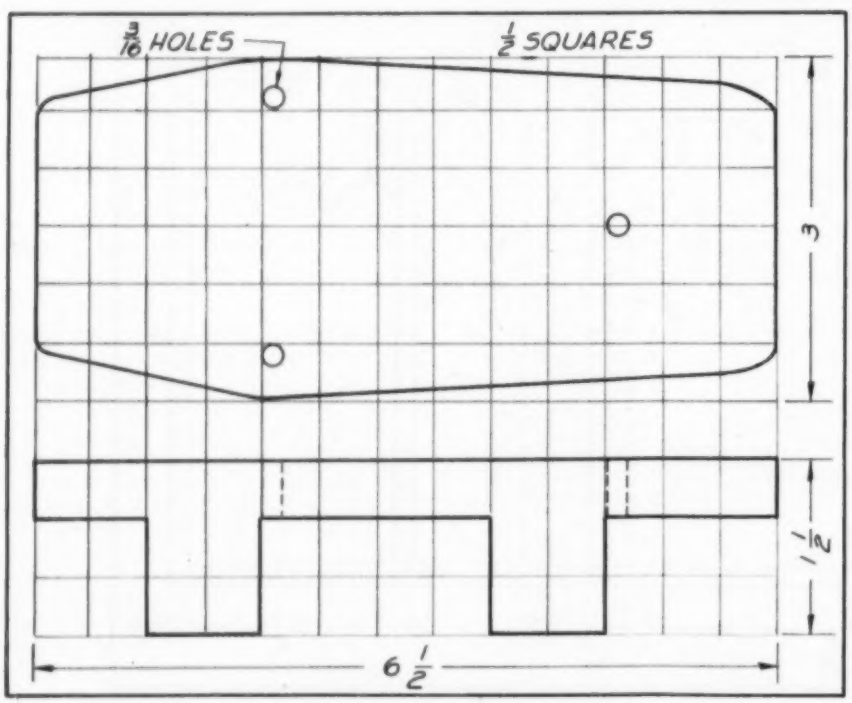
C. *Front Rails*
1. Get out stock.
2. Square to size.
3. Lay out tenons.
4. Cut and fit tenons.

D. *Top*
1. Get out stock.
2. Glue up to rough size.
3. Square to size.
4. Shape front and ends.
5. Locate and drill holes for dowels.

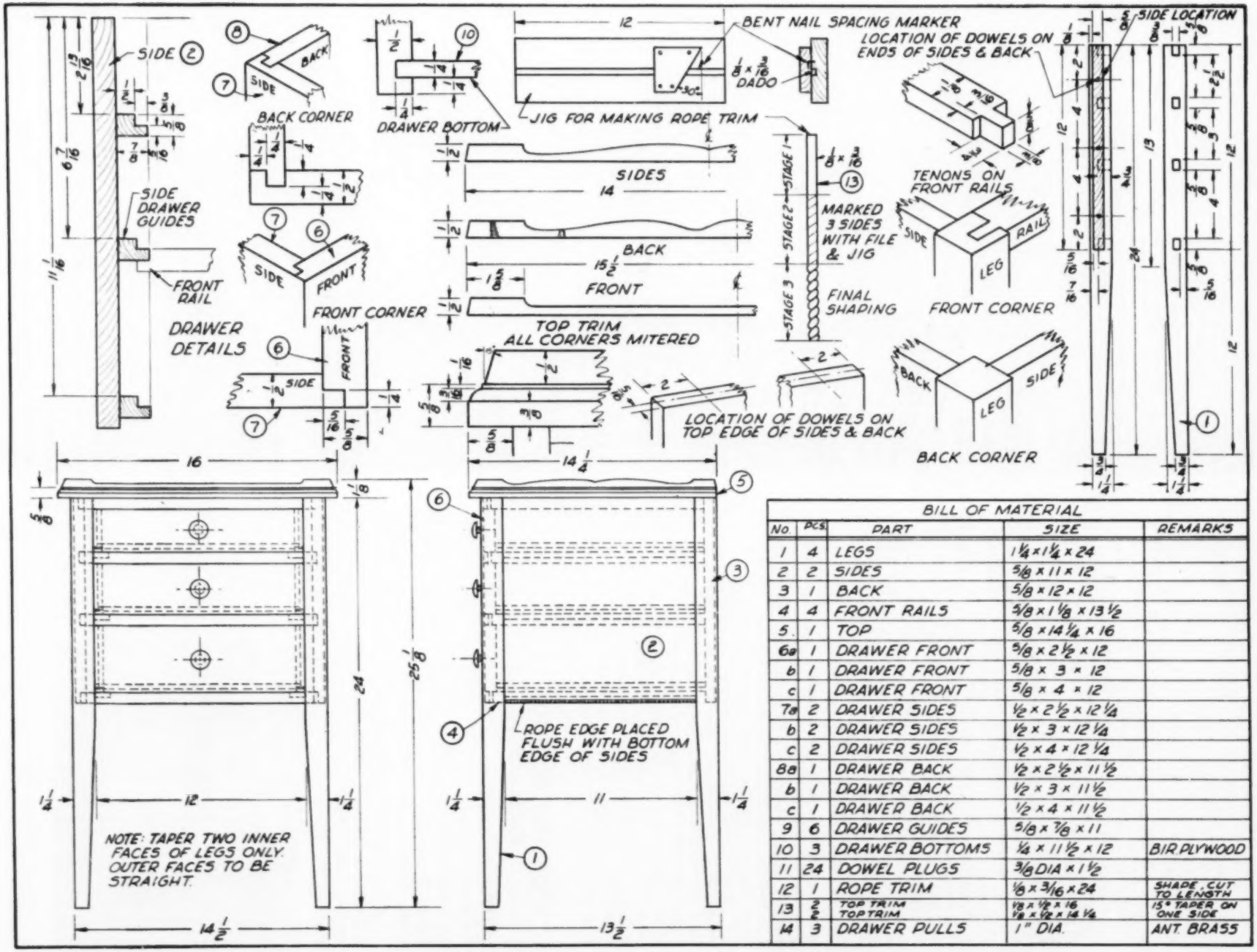
E. *Assembly*
1. Trial assembly, sides and legs.
2. Glue up sides and legs.
3. Trial assembly, back and front rails to sides.
4. Glue up back, front, and sides.

F. *Drawer Guides*
1. Get out stock.
2. Square to size.
3. Cut rabbets.
4. Glue guides in place.

G. *Drawers*
1. Get out stock.
2. Square to size.
3. Cut rabbets, front and sides.
4. Cut dado, back and sides.



Detailed drawing of a child's Japanese wood shoe



BILL OF MATERIAL

No.	PCS.	PART	SIZE	REMARKS
1	4	LEGS	1¼ × 1¼ × 24	
2	2	SIDES	5/8 × 11 × 12	
3	1	BACK	5/8 × 12 × 12	
4	4	FRONT RAILS	5/8 × 1⅛ × 13½	
5	1	TOP	5/8 × 14¼ × 16	
6a	1	DRAWER FRONT	5/8 × 2½ × 12	
b	1	DRAWER FRONT	5/8 × 3 × 12	
c	1	DRAWER FRONT	5/8 × 4 × 12	
7a	2	DRAWER SIDES	½ × 2½ × 12¼	
b	2	DRAWER SIDES	½ × 3 × 12¼	
c	2	DRAWER SIDES	½ × 4 × 12¼	
8a	1	DRAWER BACK	½ × 2½ × 11½	
b	1	DRAWER BACK	½ × 3 × 11½	
c	1	DRAWER BACK	½ × 4 × 11½	
9	6	DRAWER GUIDES	5/8 × ⅞ × 11	
10	3	DRAWER BOTTOMS	¼ × 11½ × 12	BIR PLYWOOD
11	24	DOWEL PLUGS	⅜ DIA × 1½	
12	1	ROPE TRIM	⅛ × 3/16 × 24	SHAPE, CUT TO LENGTH
13	2 2	TOP TRIM TOP TRIM	⅛ × ½ × 16 ⅛ × ½ × 14¼	15° TAPER ON ONE SIDE
14	3	DRAWER PULLS	1" DIA.	ANT. BRASS

Modified period sewing cabinet by Thomas G. King

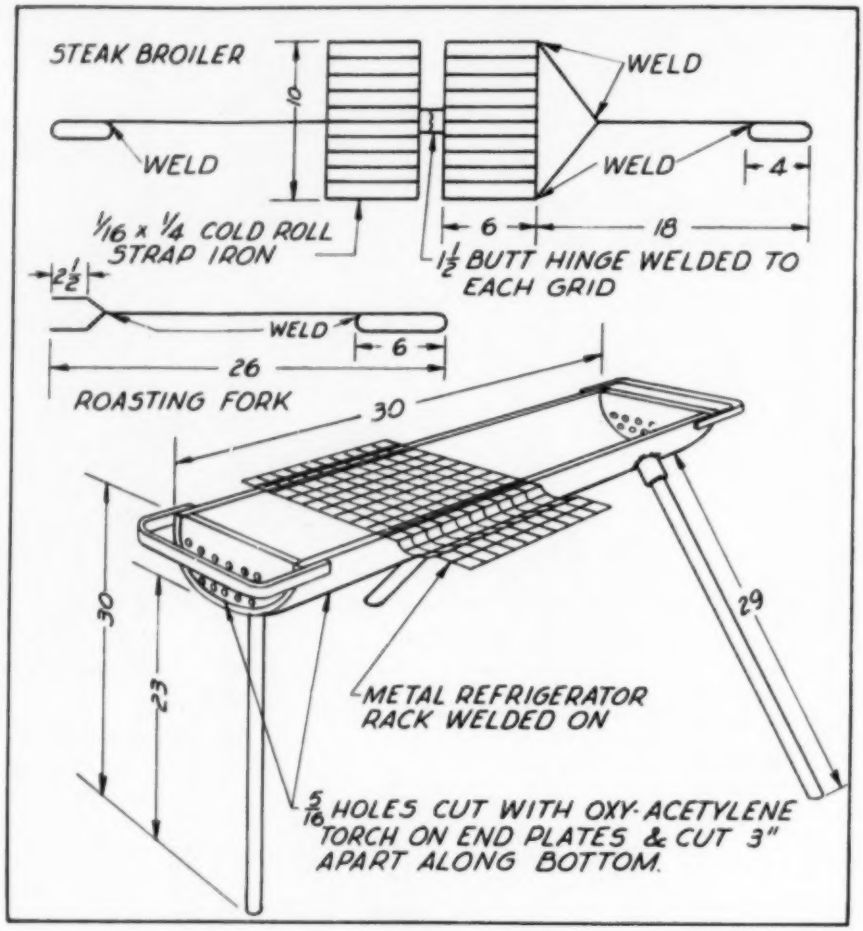
5. Rabbet for drawer bottom.
6. Trial assembly.
7. Glue up drawers.
8. Trim to fit cabinet.
9. Drill hole for pulls.

H. *Top Trim*
1. Get out stock.
2. Sand smooth.
3. Cut to shape.
4. Sand to shape.
5. Miter corners, fit and glue to top.

I. *Rope Trim*
1. Get out stock.
2. Mark with file and jig.
3. Shape the rope, sand.
4. Fit and glue to the sides.

J. *Finishing*
1. Finish sand.
2. Stain and fill.
3. Seal with shellac.
4. Apply varnish, 5 coats spar varnish.
5. Apply varnish, 2 coats good rubbing varnish.
6. Rub, pumice and oil.
7. Rub, FFF rottenstone and oil.
8. Wax.

All work on the project is suitable for either hand- or machine-woodworking classes, or combinations of both. Mortise and tenon, doweled, butt, dado, and rabbet joints are used. Even the edge design of the top may be cut at the bench with the use of a combination plane, or with backsaw and chisel. The entire unit is assembled with glue, using no metal fasteners of any kind. It is recommended that either black walnut or mahogany be used. The project requires ten plus (10.3) board feet of lumber plus three square feet of ¼-in. birch plywood for drawer bottoms. In addition it is suggested that 1-in. antiqued brass pulls be used for the drawers.



Details of the portable fireplace by Overton R. Johnson

PORTABLE OUTDOOR FIREPLACE

OVERTON R. JOHNSON
Graduate Assistant
Agricultural Engineering Dept.
Cornell University
Ithaca, N. Y.

Outdoor eating is a popular summer pastime millions of people look forward to each year. For this pastime, portable grills are becoming more and more popular.

Charcoal fireplace

The accompanying illustrations show a portable charcoal burner and accessories for aiding the outdoor chefs. This project has proved to be a very desirable welding project because it involves several areas of welding activity and metalwork. It is a good inexpensive project that creates interest easily and fosters the development of several skills. It was designed for use by collegiate students in welding but may also prove as satisfactory for high school vocational-agricultural and industrial-arts students.

Procedure

1. Using an oxyacetylene cutting torch, cut a 12-in. diameter 30-gal. water tank in half lengthwise.

2. Cut one of these halves in half crosswise to obtain the piece needed for the fireplace. (Four projects may be made from one tank.)

3. From a ⅛-in. piece of sheet metal cut out a half circle section to close the open end.

4. Close the open end by welding in the ⅛-in. section of metal using an arc welder and ⅛-in. mild steel rod. This may also be done by use of the oxyacetylene outfit.

5. Using oxyacetylene cutting torch, cut two rows of holes, approximately 5/16 in. in diameter, in each end near the bottom as shown.

6. Smooth out rough edges on the sides and ends with a portable grinder.

7. Cut ¾-in. pipe unions in half with a hack saw and bronze weld three of these halves to the bottom, as shown, for attaching the legs.

8. Cut a single row of holes, approximately 5/16 in. in diameter, with a cutting torch 3 in. apart along the bottom for additional draft.

9. Bend ¼ by ½-in. band iron to form end handles, and arc weld or bronze weld them to the top of each end for carrying handles.

10. An old rack or tray from a commercial refrigerator is attached at one end by bronze welding a butt hinge to it and the body of the burner. The hinge permits opening for building fires. A similar rack can be made from ¼-in. round iron if a rack cannot be secured.

11. The construction of the roasting forks and steak broiler is of ¼-in. cold rolled round iron and band iron. The illustrations are self-explanatory.

12. The unit may be painted (outside only) a metallic black to finish the project.

SHOP VISE

CLINTON HILLYARD
Howard Roosa Elementary School
Evansville, Ind.

The vise described in this article is very useful in any shop. It is inexpensive and will furnish more working stations for that crowded class.

Students become greatly interested in helping to make these vises. Lessons on "How to Use a Hack Saw," and "Preparations for a Weld," can be included in the lesson sheets that go with the directions for making this vise. Be sure the proper objectives are stressed in the instruction. The making of the screw and the welding can be done by high school students.

The writer has six of these vises scattered over his shop. They may be located wherever there is space for a good work station. They have done much to discourage time wasting, and have diminished discipline problems, besides increasing production because these stations are so located that better work habits are being practiced.

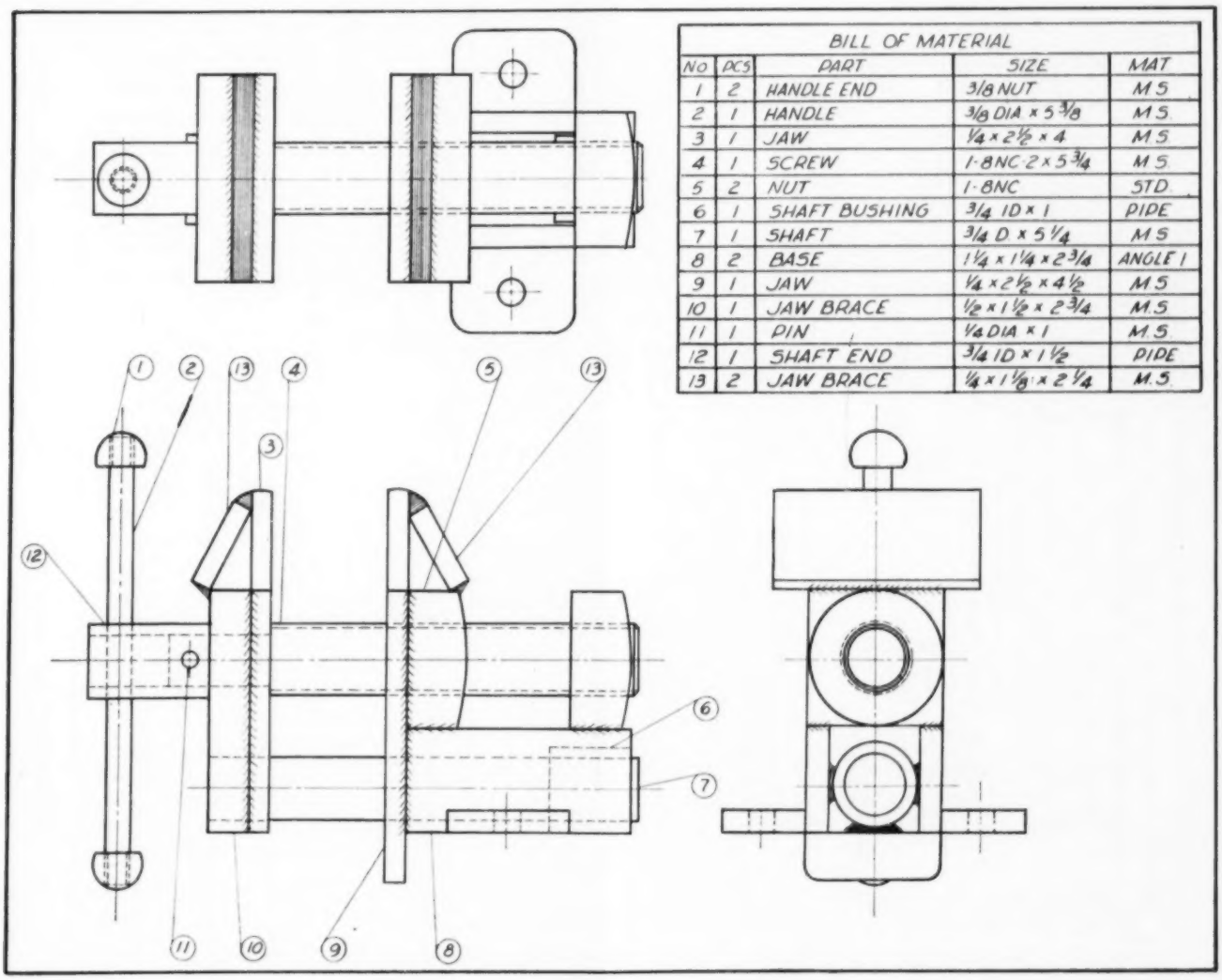
MATERIAL LIST

Part No.	*Pcs.*	*Part Name*	*Kind*	*Size*
1	2	Handle end	M.S.	⅜
2	1	Handle	M.S.	⅜ D x 5⅜
3	1	Jaw	M.S.	2½ x 4 x ¼
4	1	Screw	M.S.	1–8 x 5¾
5	2	Nut	Std.	1–8
6	1	Shaft bush	Pipe	¾ I.D. x 1
7	1	Shaft	M.S.	¾ D x 5¼
8	2	Base	A.I.	1¼ x 1¼ x ¼ x 2¾
9	1	Jaw	M.S.	2½ x 4½ x ¼
10	1	Jaw base	M.S.	½ x 1½ x 2¾
11	1	Pin	M.S.	¼ D x 1¼
12	1	Shaft end	Pipe	¾ I.D. x 1½
13	2	Jaw brace	M.S.	2¼ x 1⅛ x ¼

Fabrication

There are certain parts to be completed before the final assembly. After these parts are completed then there is a sequence of assembly welding.

1. Complete the assembly of the front jaw and locate the two holes.
2. Put the two jaws together for boring the two ¾-in. holes.
3. Take the back jaw and tap the screw hole.
4. Position the nut on the jaw with the screw in place. Weld the nut in place and also the jaw brace.
5. Complete the handle and handle ends.
6. Put the two jaws together with the screw in position and place the handle end on the screw and put the pin in temporarily to hold the jaws together.
7. Now the guide shaft can be put in place, pinned or welded.
8. The other nut can be run up in place, the guide shaft bushing put in place, the two base pieces put in place, squared up, and everything clamped in place and in alignment.
9. The final welding can then be done.
10. Check to see if everything is as it should be, and that the welds are acceptable.
11. Now rivet the handle pin in place.


BILL OF MATERIAL
NO | PCS | PART | SIZE | MAT
1 | 2 | HANDLE END | 3/8 NUT | M S
2 | 1 | HANDLE | 3/8 DIA x 5 3/8 | M S
3 | 1 | JAW | 1/4 x 2 1/2 x 4 | M S
4 | 1 | SCREW | 1-8NC 2 x 5 3/4 | M S
5 | 2 | NUT | 1-8NC | STD
6 | 1 | SHAFT BUSHING | 3/4 ID x 1 | PIPE
7 | 1 | SHAFT | 3/4 D x 5 1/4 | M S
8 | 2 | BASE | 1 1/4 x 1 1/4 x 2 3/4 | ANGLE I
9 | 1 | JAW | 1/4 x 2 1/2 x 4 1/2 | M S
10 | 1 | JAW BRACE | 1/2 x 1 1/2 x 2 3/4 | M S
11 | 1 | PIN | 1/4 DIA x 1 | M S
12 | 1 | SHAFT END | 3/4 ID x 1 1/2 | PIPE
13 | 2 | JAW BRACE | 1/4 x 1 1/8 x 2 1/4 | M S
1
2
13
4
5
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10
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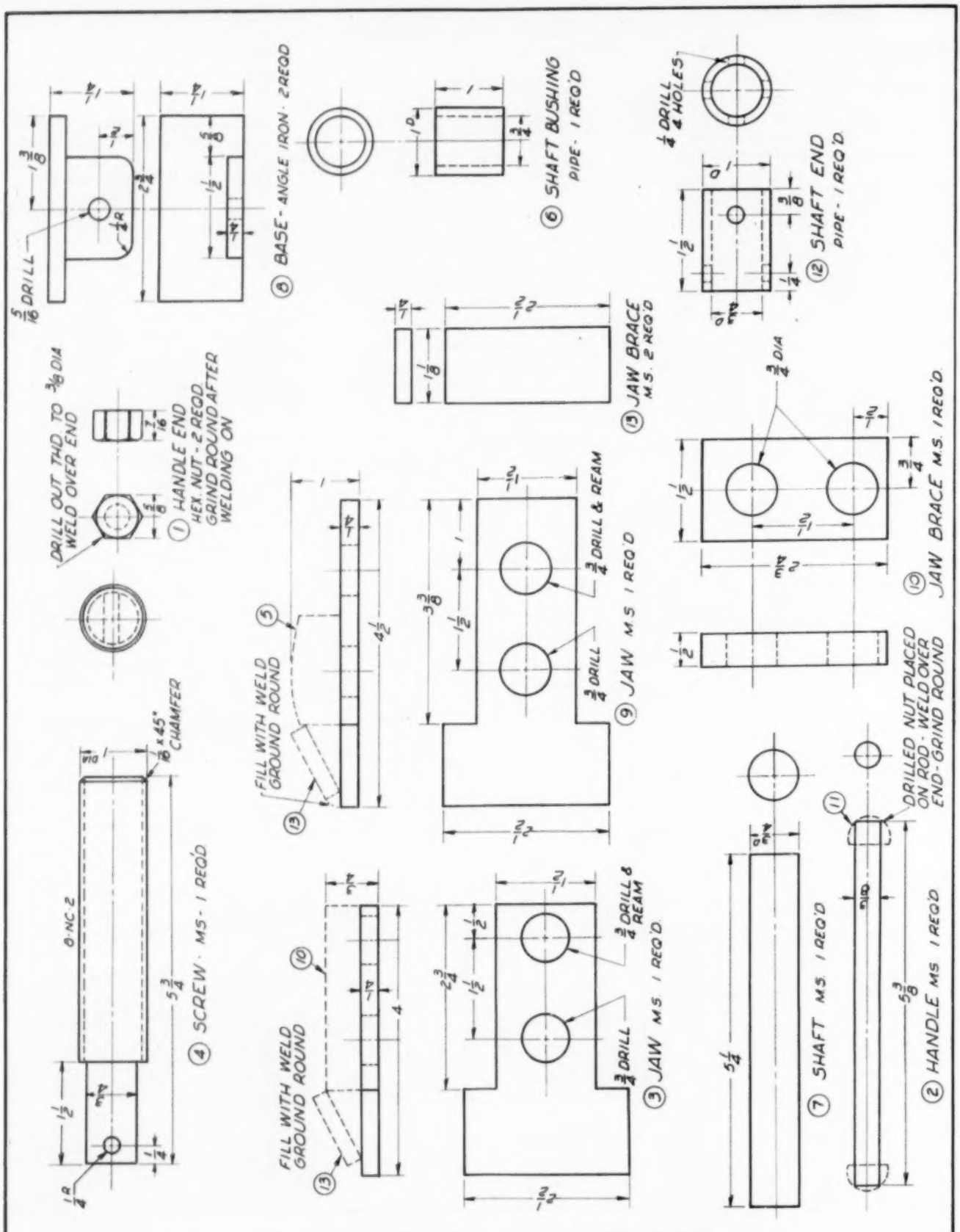
8

Assembly drawing and bill of materials of the shop vise



Details of the shop vise

12. Clean and prepare the vise for paint.
13. Paint, using an implement paint of any color.

This makes a very rugged vise and will withstand hard usage. The students enjoy working on these vises.

NOTE: As a precaution protect the threads of the screw from the welding sparks while welding.

FOLDING SCREEN

FREDERICK L. BROADHURST
North Carolina State College
Raleigh, N. C.

The folding screen illustrated and described herein, appeals to students because of its contemporary design, its usefulness, and its simplicity. It was used as a group project in an industrial-arts woodworking class and proved so successful that practically everyone in the class wanted to make one. It also won favorable comments from students of design.

Construction of this project involves the use of the circular saw, the drill press, the jointer, the planer, and the router. In addition to the use of these machines, the student will gain valuable experiences in frame construction, dowel joint construction, sanding and finishing.

He will also be required to work with veneer, a material which is invaluable to the furniture industry, very adaptable to school shop use, but seldom used.

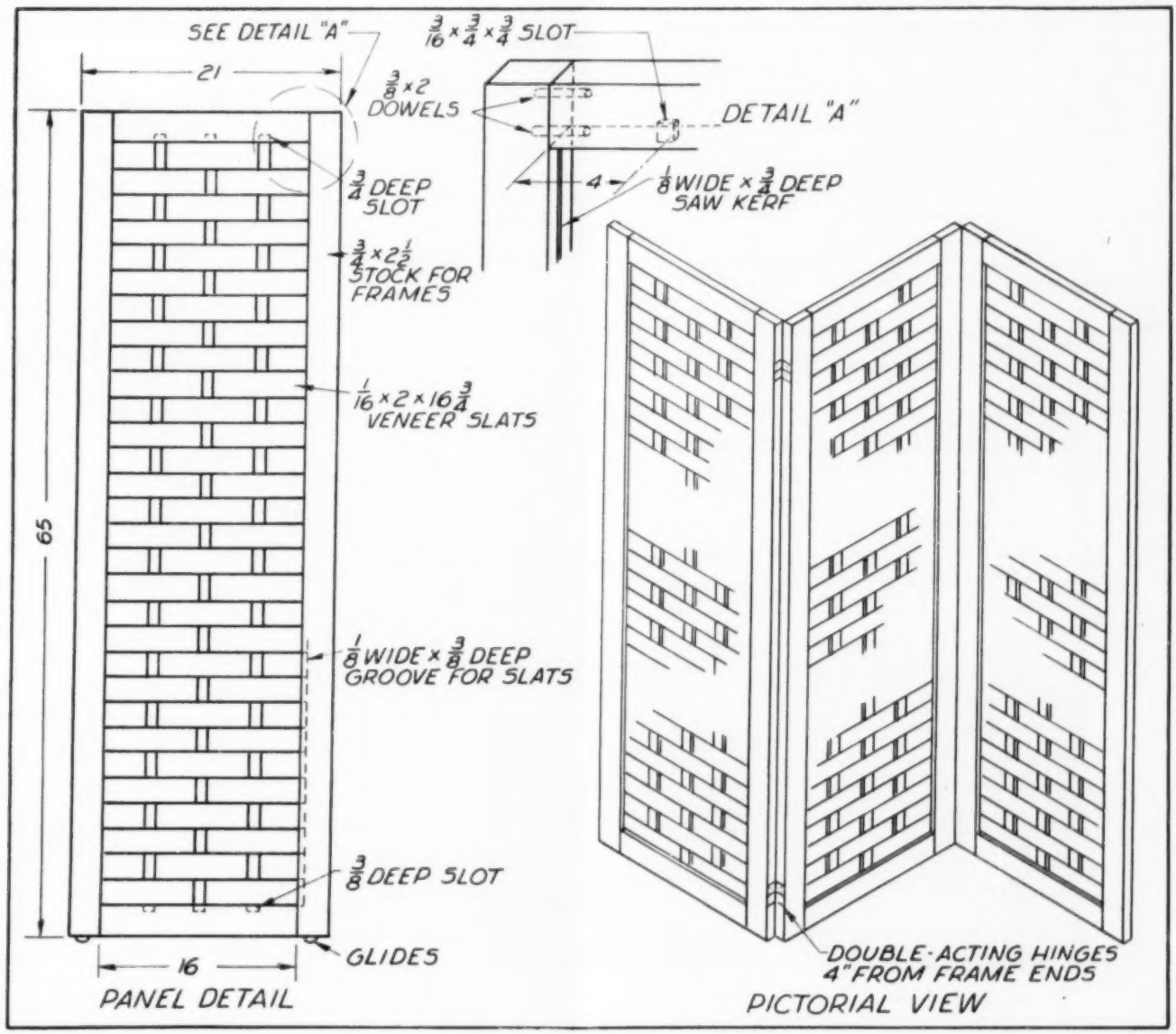
BILL OF MATERIALS

Name of Part	*No. of Pieces*	*Description*	*Size*
Frame sides	6	Poplar or basswood	¾ x 2½ x 65
Frame ends	6	Poplar or basswood	¾ x 2½ x 16
Veneer slats	90	Maple or gum	1/16 x 2 x 16¾
Separator strips	9	Mahogany	3/16 x ¾ x 61⅛
Double action hinges	4 or 6	Steel or brass	¾ x 1¾
Glides	6	Steel	½ dia.

Suggested Procedure

Frames

1. Cut stock to length.
2. Saw stock to rough width.
3. Plane stock to rough thickness.
4. Saw groove down center of frame sides on the inside edge.
5. Rout slats in frame ends.
6. Drill dowel holes in frame sides and ends.
7. Smooth frame sides and ends to finished dimensions.
8. Assemble frames with dowels and glue.
9. Do final sanding.



Details of the folding screen

Veneer Slats

1. Sand sheets of veneer smooth.
2. Clean off all sanding particles.
3. Cut veneer sheets into strips to given dimensions.
4. Sand edges of veneer strips.

Separator Strips

1. Cut stock to length.
2. Plane stock to ¾-in. thickness.
3. Saw strips to rough dimensions.
4. Plane strips to dimensions.
5. Do necessary sanding.

Assembling and Finishing

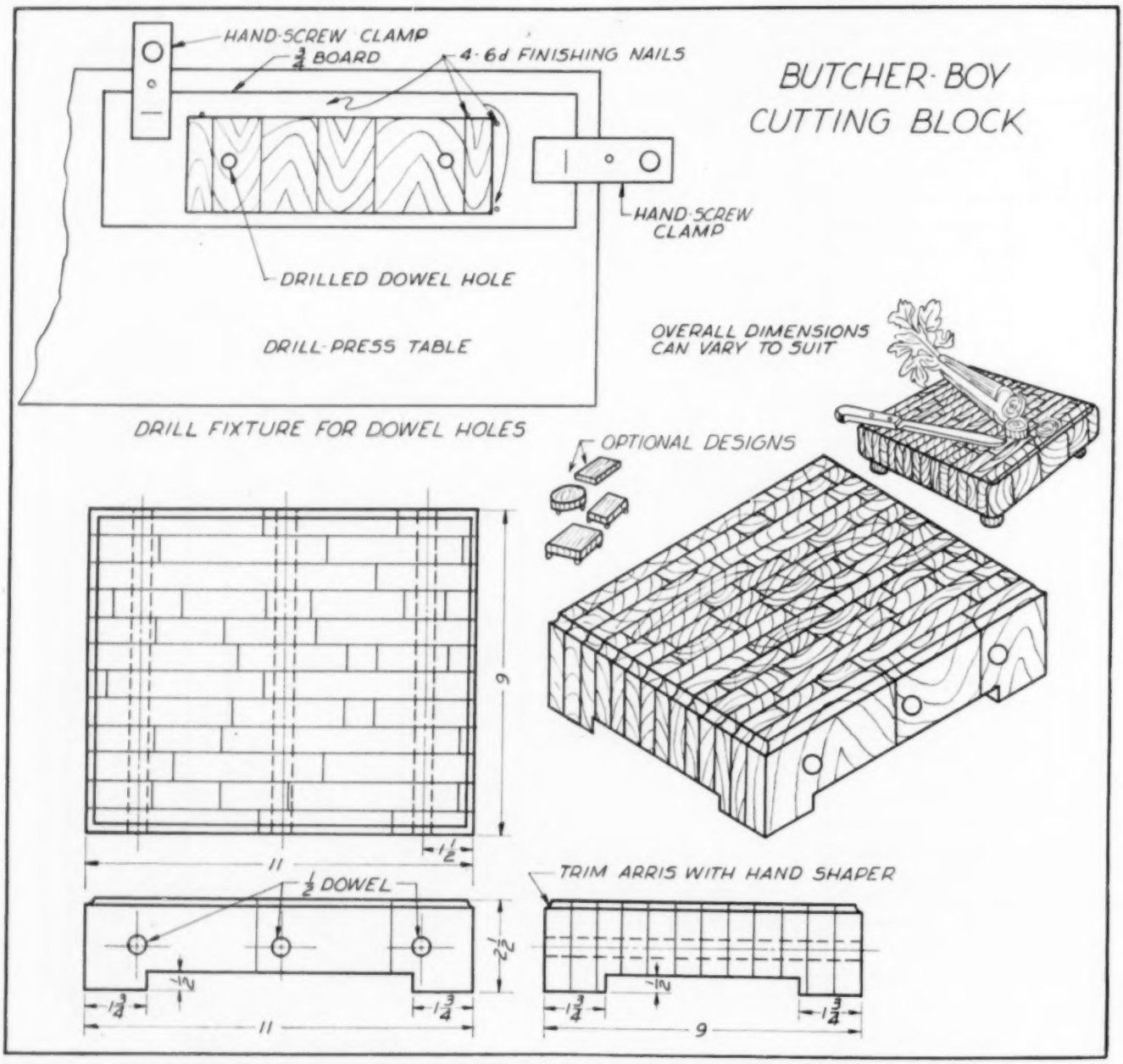
1. Insert veneer slats into frames as shown in drawing.
2. Finish by spraying with lacquer or shellac.
3. Finish separator strips with lacquer or shellac and weave them between veneer slats.
4. Spray assembled panels with final coat of lacquer or shellac.
5. Do polishing operations.
6. Attach double action hinges as shown.
7. Attach glides as shown.

The United States produced 55.7 per cent of the oil in the free world in 1952. — *Petroleum Newsnotes.*

BUTCHER-BOY CUTTING BLOCK

LOUIS BAROCCI
High School
Cudahy, Wis.

The butcher-boy cutting block allows for the utilization of much of the short stock found in the school woodshop. Any short stock 8 to 15 in. long is glued together to obtain a width of approximately 12 in. After removing the glued stock from the clamp, scrape off the glue and clean up both sides on the planer or jointer.



Details of the butcher-boy cutting block

Cut these pieces in strips 2½ in. across the grain. The holes for the dowels can be drilled before gluing or after gluing. Drill holes on the drill press for speed and accuracy. In the school shop when a large number of boys have indicated their desires to make these, the teacher should make a drilling fixture which should be clamped to the drill-press table.

The sketch shown at the upper left-hand corner of the detail illustration of the cutting block gives an idea of how the drill fixture is clamped to the drill-press table.

The legs are cut out on the circle saw using the dado head and the saw fence. After sanding, give the cutting block an oil and wax finish.

This project won a place award in the 1953 Industrial Arts Awards sponsored by the Ford Motor Company.

DIVIDING HEAD MASTERY ON PAPER

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Chadsey High School
Trade Division
Detroit, Mich.

The use of the milling machine dividing head is a deep mystery even to many advanced machine-shop students. There just are not enough milling machines, or there is not enough class time, to enable more than a few to learn how to use this important milling machine accessory. The great amount of time required to set up a machine for a typical dividing head job and the editorial time needed to perform the job always have been considered necessary but this greatly limits the number of pupils that can be instructed.

At times, however, it is possible to get one or more dividing heads so that it is possible to extend the opportunity to learn how to use them to a larger number of students.

This case was true at our school. In a separate room away from the machine shop, a dividing head can be set up on a table or bench as shown in Figures 2 and 3. It should be mounted on two wooden blocks, to give it height. A plain tapered shank to fit the spindle was made up. It was provided with a ¾—20 N.C. tapped hole to attach the wooden faceplate. The faceplate is ¾ in. thick and 6 in. in diameter. It has a counterbored hole for mounting on the shank. A piece of plain paper is thumbtacked to the faceplate. A pencil is wired to the scriber of a surface gauge. This completes the necessary equipment for teaching any sort of plain indexing on the dividing head.

When the project is made, that is under way, in our shop or classroom the student works from a lesson sheet or lesson card which he obtains from the tool crib with the other necessary tools. Following is a complete copy of this lesson card. It gives all the additional information needed to set up the project. The questions are written out and answered by the pupil. This is part of the job.

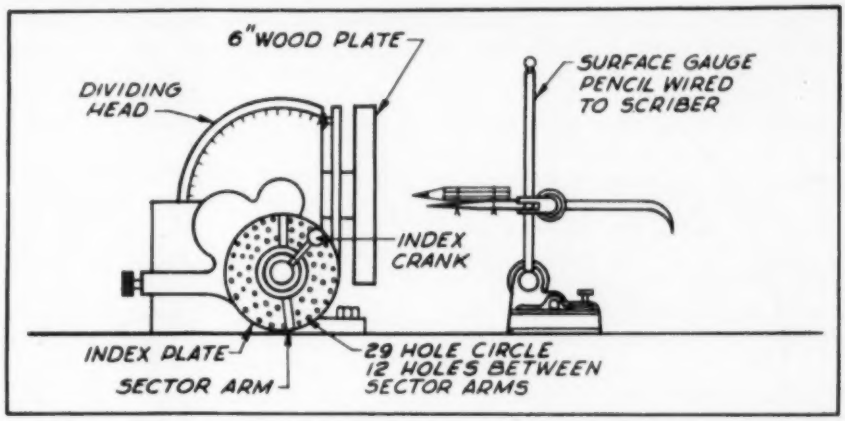


Fig. 1. The dividing head mastery on paper

The Dividing Head

The dividing head, shown in Figure 1, is one of the principal accessories of a milling machine. With it it is possible to divide a circle into a given number of equal parts. It is used in cutting gear teeth, fluting drills, or cutting hexagons and squares, or performing other jobs that require equally spaced cuts.

The dividing head contains a worm in mesh with a worm wheel. Forty turns of the crank handle (worm) will revolve the spindle (worm wheel) one complete turn. One turn of the crank will revolve the spindle 1/40 of a complete turn. It would be very easy to divide a circle into 40 parts — just one turn of the crank each time.

What to do:

1. With a divider cut out a 6-in. disk of notebook paper.
2. Thumbtack this paper disk to the wooden plate on the dividing head spindle.
3. Get a surface gauge from the crib and mount a pencil on the scriber.
4. Your problem is to mark 29 equal divisions with the pencil on the paper disk.
5. In this unit the problem is all set up for you. It was done in this manner: 40 divided by 29 is $1\frac{11}{29}$, so one turn of the crank and 11 holes on the 29 circle will give you $\frac{11}{29}$ of a complete turn of the spindle. Notice that the sector arm is set to clear 12 holes. The index crank is in one of the holes so just 11 holes show on the 29 circle.
6. Have the index crankpin in one of the top holes of the index plate on the 29 circle.
7. Put the left-hand sector arm against the index crankpin.
8. Make first pencil mark.
9. Index for next division by turning index crank one turn to right and then stop at the hole by the right arm of the sector.
10. Reset the sector, make pencil mark and so on.

Questions:

1. Give an example of another machine using a worm and worm wheel.

A. *Drill press, winch, tractor steering gear.*

2. How many teeth are there on the worm wheel in the dividing head?

A. *40*

3. How many turns are necessary to index for 10 divisions? 4 divisions? 5 divisions? and 20 divisions.

A. *4, 10, 8, 2*

4. How many circles of holes are on the index plate that is on the head? How many holes each?

At left — Fig. 2. Ready for the job of dividing the circle. At right — Fig. 3. Dividing the circle on the paper disk

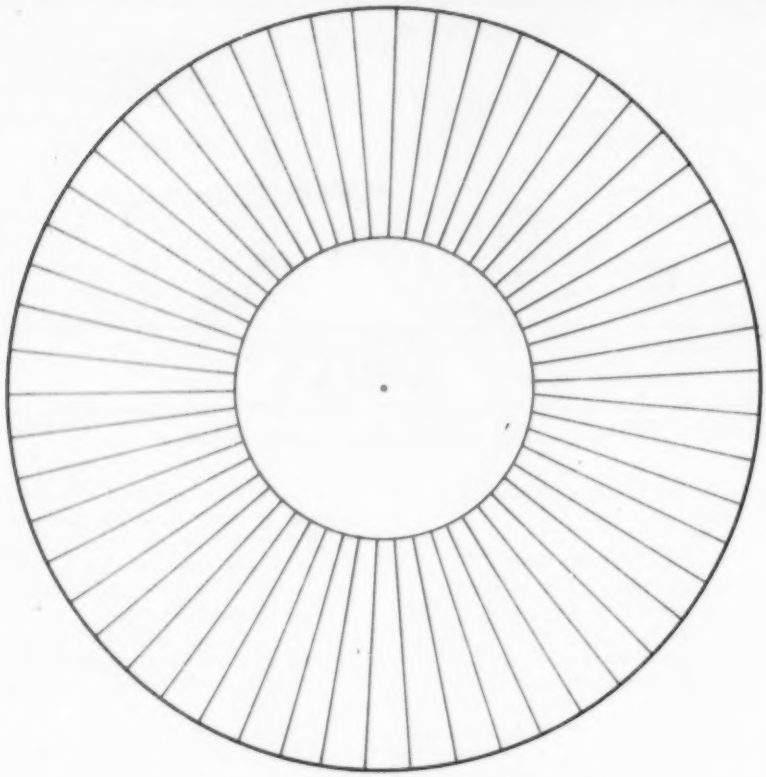


Fig. 4. Disk to be used on the dividing head

A. *6, 33, 31, 29, 27, 23, and 21*

5. Are there any other index plates furnished with the head? If so, how many?

A. *Yes, 2*

6. What do you do to save counting the holes for each move?

A. *Set the sector arms.*

7. In which direction should the index crank be turned? Why?

A. *Right. To avoid confusion.*

8. Can the indexing be done with the head at 45 degrees? at 90?

A. *Yes. Yes.*

9. What standard taper does the spindle have?

A. *No. 9 B. & S.*

10. How is a chuck mounted on the index head spindle?

A. *On a threaded nose like a lathe.*

For reference, in addition to the lesson card, the pupil can use any advanced machine tool operation book and tool catalogs.

When an especially interested student wants more experience in simple indexing he is given several other problems and is required to make the set up himself. For example: index a practice sheet to 54 equal divisions. 40 divided by 54 equals $\frac{40}{54}$ so 40 holes on a 54 index circle. If there is no 54 circle the different ratios are worked out such as $\frac{40}{54}$, $\frac{20}{27}$, $\frac{60}{81}$ so the 27 and 81 circles would also be correct with the sector arms properly set. Another example: index a practice sheet to 11 equal divisions. 40 divided by 11 equals $3\frac{7}{11}$. That makes three turns and 7 holes on an 11 circle for each division. Index plates with 11 hole circles aren't common so the other ratios are obtained: $\frac{7}{11}$, $\frac{14}{22}$, $\frac{28}{44}$, $\frac{21}{33}$, $\frac{42}{66}$, $\frac{49}{77}$, and so on. The 33 circle is generally available, so is used in this case.

The students usually enjoy this project. They appreciate the necessity of extreme care needed to avoid mistakes. An error of only one hole during any of the moves, of course, spoils the job.

SOME SPELLING RULES

J. ALLEN MORRIS
Murray Vocational School
Charleston, S. C.

Perhaps the hardest problem facing the English instructor in a vocational or trade school is that of improving the spelling knowledge and ability of his students. In the February, 1937, issue of INDUSTRIAL ARTS AND VOCATIONAL EDUCATION magazine (pages 44–49), I suggested a workable plan for increasing spelling knowledge and enlarging the vocabularies of vocational school students. The five lists of words printed then are, I believe, as useful today as they were ten years ago. They are still available in libraries which have bound copies of this magazine.

In addition I use several mimeographed sheets which test students' knowledge of spelling rules and help boys learn the rules they do not know. There is nothing original about this material, except possibly its organization; but these sheets are time-tested and good; they do what they are supposed to do. Using them, thousands of boys have learned to spell much more accurately than they otherwise would have.

EI-IE

Write the following words, filling in either EI or IE:

c _ _ ling	sold _ _ r	hyg _ _ ne
ser _ _ s	cash _ _ r	ch _ _ f
bel _ _ ve	conc _ _ t	p _ _ ce
dec _ _ ve	rec _ _ ve	f _ _ ld
f _ _ rce	n _ _ ce	th _ _ f
rel _ _ f	ach _ _ ve	front _ _ r
rec _ _ pt	perc _ _ ve	bes _ _ ge
pat _ _ nt	misch _ _ f	p _ _ rce
rev _ _ w	fr _ _ nd	dec _ _ t
shr _ _ k	sh _ _ ld	y _ _ ld

If a student makes mistakes in writing the words in the "EI-IE" test, he is given the following study paper:

Using EI or IE

On your paper copy the following rule: "Use *ie* in most words. After the letter *c* use *ei*. One easy way to remember this rule is to memorize the jingle: *"E* is a sailor and follows the *C."*

Copy the following words on your paper. Look for words which have the letter *c* in front of the *ei*. Whenever you see a word with *c* in front of *ei*, write this part of the rule beside the word: After *C*, use *EI*.

ceiling	soldier	hygiene
series	cashier	chief
believe	conceit	piece
deceive	receive	field
fierce	niece	thief
relief	achieve	frontier
receipt	perceive	besiege
patient	mischief	pierce
review	friend	deceit
shriek	shield	yield

Later, he is tested again, usually several times before graduation — until he finally knows this rule thoroughly. Unless a student asks about exceptions, I do not include them in this study work.

-ING

Write the following words with *-ing:*

gauge	omit	compel	refer
write	brace	equip	cure
value	plan	use	thin
come	forbid	whip	ship

expel	sheathe	guide	arrive
file	make	shape	regret
spin	grab	forget	swim
wrap	step	hone	case
run	hope	grin	bore
argue	spar	prefer	square
scrape	admit	begin	trim
cut	blame	blur	bridge

For mistakes in the three rules represented in the foregoing test, the following study blocks are given:

Final -E Rule

Copy the following rule and examples:

RULE: When a word ends in the letter *e*, drop the *e* before adding -ing.

gauging	guiding	siding
writing	shaping	*coping*
valuing	honing	riding
coming	arriving	*taking*
bracing	casing	ruling
using	boring	shaking
filing	squaring	driving
arguing	bridging	diving
scraping	*hoping*	naming
sheathing	carving	pleasing
making	glazing	trading
blaming	curing	

Doubling Final Consonants – I

Copy the following rule and examples:

RULE: When a word ends in a consonant which has a vowel in front of it, double the last letter – if it takes only one breath to say the word.

The vowels are *A-E-I-O-U*. The other letters of the alphabet are consonants. A *one-breath* word is a word of one syllable.

planning	*stepping*	strapping
whipping	sparring	swapping
thinning	grinning	slapping
shipping	rubbing	hopping
wrapping	trimming	winning
running	swimming	spinning
cutting	*stopping*	popping
grabbing	dropping	tapping

Doubling Final Consonants – II

Copy the following rule and examples:

When a word ends in a consonant, has a vowel in front of the consonant, and has the last part of the word pronounced louder than any other part, double the consonant before adding *-ing*.

forbidding	equipping	expelling
forgetting	beginning	permitting
compelling	referring	admitting
preferring	regretting	omitting

-YING

Write the following words with *-ing:* study, deny, carry, hurry, try, cry, certify, fly, specify, bury, spy.

If a student misses one or several of these, he copies the following:

When a words ends in *y*, leave the *y* on the word and add *-ing:* studying, denying, carrying, hurrying, trying, crying, specifying, certifying, flying, burying, spying.

-LY

Change the following adjectives to adverbs by adding *-ly:*

easy	final	accidental
slow	lucky	natural
wise	heavy	rapid
busy	happy	practical
sure	careful	total
real	general	entire
mere	steady	ready

To learn how to do this properly, a boy copies and studies the following:

Adding -LY

When a word ends in *y*, change the *y* to *i* and add *ly*. Otherwise,, just add *ly*.

(y to i + ly)

easy — easily
busy — busily
heavy — heavily
happy — happily
steady — steadily
lucky — luckily
ready — readily

(Other words)

mere — merely
general — generally
natural — naturally
slow — slowly
sure — surely
final — finally
rapid — rapidly
wise — wisely
real — really
careful — carefully
accidental — accidentally
practical — practically

-FUL

The instructor can test this orally in a few minutes by dictating several words which end in *-ful*. Some words which may be used for dictation are as follows: dreadful, awful, lawful, powerful, thankful, grateful, prayerful, cheerful, cupful, spoonful, handful, helpful, careful.

When the suffix *-ful* is added to a word, it is spelled *-ful*. If the word *full* is used as a separate word, it is spelled *full*.

Some boys, of course, need additional work on the rules which they have studied. Just copying or studying a rule and a set of examples is not enough for the poor speller, though it suffices for many a fairly good speller. *Make-up* work can be used for words missed, the student writing the correct forms of the words missed a number of times (5-10-25) until he has memorized the correct spelling. Sentences using the correct forms (words listed as examples of rules) seem to help with the *EI-IE* words, words ending in *-ying*, *-ful*, and *-ly*. For extra work on words ending in *-ing*, the student can be told to write a list (25 or 50 words) of present participles based on operations in his shop. These can be used later in sentences if the instructor thinks that still more work is needed.

In my school spelling rules are learned gradually, over a period of four years. In the senior year, before a student is certified for graduation, he is required to prove a practical working knowledge of the entire set of rules.

If the drill sheets described above are used carefully and conscientiously, improved spelling in students' written work will be noticeable by the end of the third year.

AUTOMOBILE RADIO TEST

(Continued from page 53)

5. The most commonly used cold-cathode rectifier tube is the .....
6. The lead in cables on practically all the new antennas are terminated in the ..... type plugs. However, they can be quickly connected to the ..... type plug.
7. The most common causes of noise or interference in a car receiver is the ..... system and the .....
8. All heater, plate, screen, and bias voltage in an automobile receiver is derived from a ..... volt d.c. source. Some cars, however, have used a ..... volt battery.
9. The following rectifier tubes (80, 5Y3, 5F4) cannot be used in an automobile receiver for two reasons. First they are designed for ..... volt operation and they use a ..... type cathode.
10. The reed in a vibrator tends to change a smooth flow of direct current to a ..... or varied current.

KEY FOR TEST

True-False Test

1. true	5. true	9. false	13. true	17. false
2. true	6. true	10. true	14. true	18. false
3. false	7. true	11. false	15. true	19. false
4. true	8. true	12. true	16. false	20. false

Multiple-Choice Test

1. *c*	3. *c*	5. *a*	7. *c*	9. *b*
2. *b*	4. *b*	6. *b*	8. *b*	10. *c*

Matching Test

1. J	3. H	5. K	7. C	9. E
2. A	4. G	6. N	8. B	10. M

Completion Test

1. octal
2. vibrator, transformer, rectifier, filter
3. buzzer
4. self-rectifying
5. 0Z4
6. pin, bayonet
7. ignition, generator
8. 6.3, 12.6
9. 9–5, filament
10. pulsating

PLANNING AND CONSTRUCTING SMALL-SCALE BUILDINGS

NORMAN W. RISK
and
GEORGE A. WILLOUGHBY
Michigan State Normal College
Industrial Arts Department
Ypsilanti, Mich.

This is another industrial-arts project for the elementary grades.

Layout Procedure

1. Select tagboard or like material, lay out dimensions using chart shown below. Determine size desired for finished building.

2. Design windows, doors, and any other parts. Then cut out entire pattern as shown. Windows, shingles, and the like can be drawn on before cutting. Be sure to provide *F* flaps for folding and gluing.

3. Assemble and glue all pieces together, chimney and gables being fastened on last.

Related Information

Almost any type of house may be identified by its roof shape. The cottage or *hip* roof is one of the popular types.

The teacher in the elementary grades can make use of this miniature building, other types, or combination of two or more, in her classroom. Suggestions might be a sand table and panoramic displays, showing such things as community living, people of other lands, safety instruction, and the like.

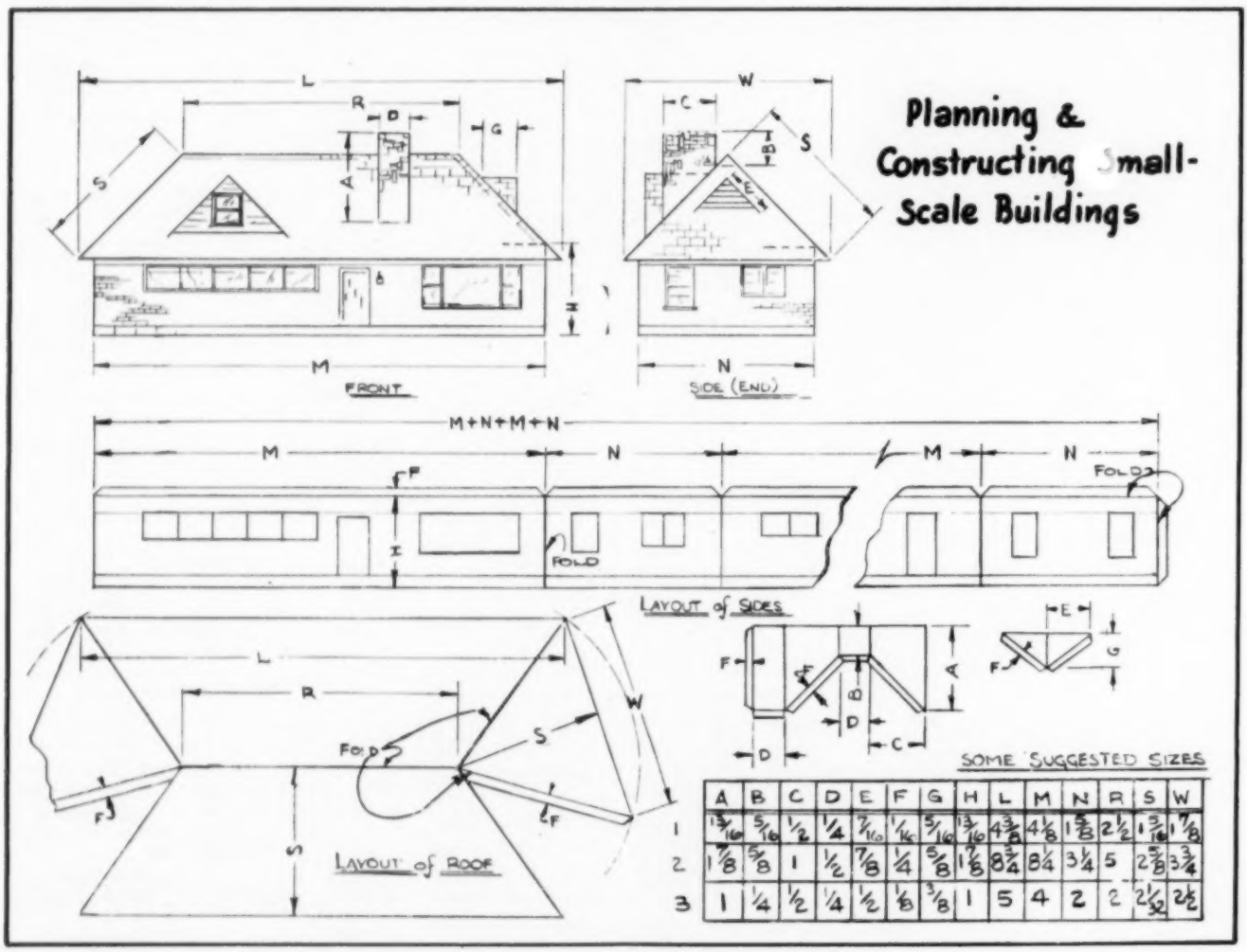
The best procedure in making these buildings is to use tag or stiff paper of the color you wish the final building to be. Suggested combinations might be red roof, white sides, or black roof with sides light green or any suitable color. Windows, doors, and other parts can be cut from construction paper or painted, or inked, on. It is wise to *decorate* sides and roof before gluing it together.

Thirty-one of the 40 basic industry classifications reduced their frequency rates, and 25 reduced severity rates.

The average accident frequency rate for employees in all industries submitting company reports to the Council, based on the number of disabling injuries per 1,000,000 man-hours, was 8.40 in 1952 — a reduction of 7 per cent from the year before.

The average accident severity rate for all industries reporting to the National Safety Council, based on the number of days lost per 1,000 man-hours, was .88 last year — a decrease of 9 per cent from 1951. — *National Safety Council*

An oil well 5000 feet deep was rare in 1925. Today, it is considered a relatively shallow hole because many modern wells are drilled down to 12,000 feet and more. At least one test well has gone below 20,000 feet. With an expanding drilling program such as this, the oil industry can continue to find new oil reserves and provide amply for the nation's oil needs. — *Petroleum Newsnotes.*



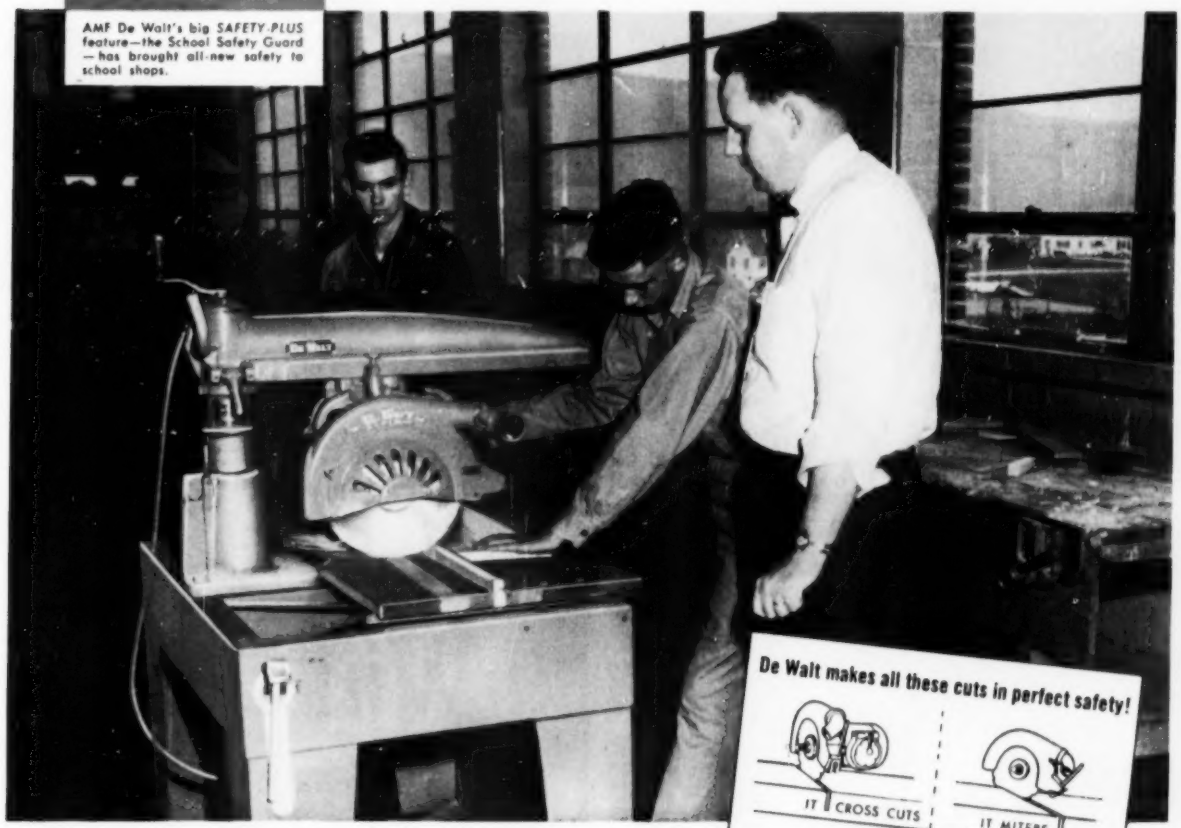
	A	B	C	D	E	F	G	H	L	M	N	R	S	W
1	15/16	5/16	1/2	1/4	7/16	1/4	5/16	13/16	4 3/8	4 1/8	1 5/8	2 1/2	1 3/16	1 1/8
2	1 1/8	5/8	1	1/2	7/8	1/4	5/8	1 1/8	8 3/4	8 1/4	3 1/4	5	2 3/8	3 3/4
3	1	1/4	1/2	1/4	1/2	1/8	3/8	1	5	4	2	2	2 1/32	2 1/2

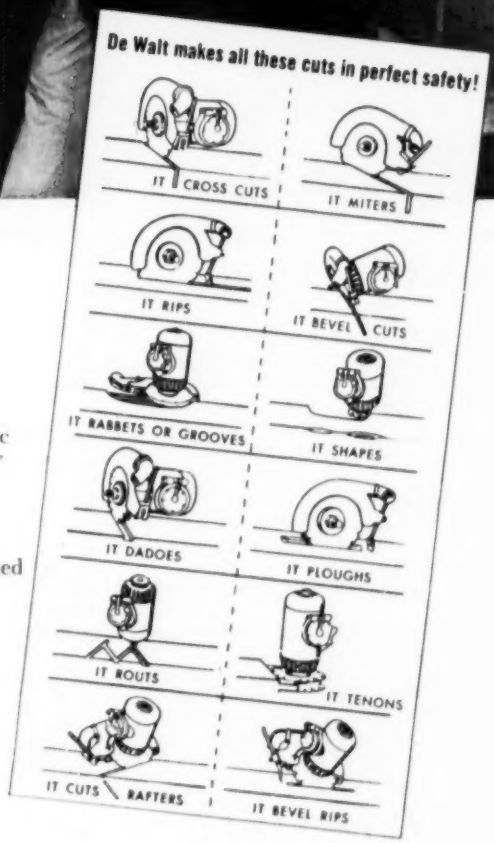
Planning and constructing small-scale buildings

"I'm really sold on AMF De Walt as a safe multi-purpose tool!"

says E. F. Wilson, Instructor, Vocational Agriculture Dept., George Wythe High School, Wytheville, Va.

AMF De Walt's big SAFETY-PLUS feature—the School Safety Guard—has brought all-new safety to school shops.





"Like most instructors, I was wary about having my students work with a multi-purpose tool. But when I saw how safe AMF De Walt® is, I got one right away. Now my students can learn as many as 15 different operations.

"And I don't worry about their safety, thanks to features like AMF De Walt's Blade and Arbor Guard, Anti-kickback Device for all operations from ripping position and the new Automatic Safety Carriage Lock. That's why I'm really sold on AMF De Walt."

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YOU ARE ELIGIBLE for this contest if you are an industrial arts instructor or if you are presently enrolled in an industrial arts teacher training institution.

THE PROJECT you submit employing the use of Dek-tufts will be judged by leaders in the industrial arts field. All photographs submitted will become the property of Jaydon, Inc., manufacturers of Dek-tufts.

PRIZES WILL BE AWARDED on the basis of originality and practical use. The decision of the judges will be final. All entries must be postmarked no later than March 1, 1954. Winners will be announced in the May issue of Industrial Arts and Vocational Education.

SEND FOR enough Dek-tufts to start your project. As a special offer Dek-tufts may be purchased by schools at 6¢ per square (regular retail price 10¢ per square). Eight vibrant colors combine and contrast with all color schemes: forest green, lime, gray, red, ivory, beige, tuscan wine, and black. A box of 50 threaded matching nails is only 25¢. If not completely satisfied your money will be refunded.

Don't delay. Start your project and send in a photograph to

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Personal News

RT. REV. MSGR. CARROLL F. DEADY AWARDED HONORARY LIFE MEMBERSHIP

Monsignor Carroll F. Deady, superintendent of schools of the Archdiocese of Detroit, was awarded an honorary life membership in the Mu Sigma Pi Fraternity on Friday, December 11, 1953. The fraternity is an organization of Wayne University graduates who are industrial-education teachers in schools and industry.

Monsignor Deady was the unanimous choice of the Fraternity for this year's award. His foresight, planning, and efforts, have resulted in the establishment of a system-wide program of drafting and other subjects. This program of industrial education in parochial schools has brought him national recognition, and led to the decision of the Fraternity to name him the outstanding contributor in the field of industrial education for 1953.

HERMAN A. POHLMAN RETIRES

Herman A. Pohlman, industrial arts consultant for the Newton, Mass., public schools, retired from active service in June, 1953, and has moved to St. Petersburg, Fla., to enjoy life.

He was a member of the first "all men's class" to be graduated from the Sloyd Training School of Boston. He holds a B.S. of Ed. from Fitchburg State Teachers College, and an Ed.M. from Boston University. He has studied at Harvard, M.I.T., and Wentworth Institute. He is a member of Epsilon Pi Tau and Phi Delta Kappa.

For the past ten years he has been a lecturer at Boston University School of Education. He was also visiting lecturer of Hillyer College of Connecticut. He was an instructor in the Adult Evening Educational Program of the Practical Arts Division of the Vocational Education Department of the state.

He completed 35 years of teaching, 34 of which were in the city of Newton. He was appointed consultant for the city in 1935 and served well until his retirement. He is a veteran of World War I.

Mr. Pohlman will be missed by a host of fellow teachers and friends who realize that New England is losing a real person as well as an outstanding educator. — *Herbert B. Downs.*

JOSEPH W. SLYVA

Joseph W. Slyva was appointed consultant of industrial arts for the city of Newton, Mass., to fill the vacancy created when Herman A. Pohlman retired in June, 1953.

Mr. Slyva is a graduate of the Graduate Training School for Teachers of Mechanic Arts of Boston, the Fitchburg State Teachers College with a B.S. of Ed., and the Graduate School of Education at Harvard with an Ed.M. He is at present a doctorate candidate at Boston University.

He is a member of Epsilon Pi Tau, the NEA, secretary of the Industrial Arts Committee of the Massachusetts Teachers Association, New England Industrial Arts Association, and a past president of the Massachusetts Industrial Education Association.

Before teaching at John W. Weeks Junior High School in Newton, he taught at the Hyde Park High School, Boston. He is instructor in the evening adult program of the city and has taught Power Tools for Delta Tools at the Dedham Hobby Club. Mr. Slyva learned the cabinet trade and is a veteran of World War II. — *Herbert B. Downs.*

♦ Dr. Charles Risher is a new instructor in industrial arts at Eastern Carolina College, Greenville, N. C. He received the doctorate at the University of Missouri in June, 1953. Dr. Risher has had teaching experience at the University of Missouri, the University of California, Northwestern State College, Natchitoches, La., and several high schools in Missouri.

♦ Clarence A. Needler, an educator with 30 years of experience in vocational education, was recently appointed by the Studebaker Corporation of South Bend, Ind., to head its apprenticeship program. Mr. Needler was formerly industrial co-ordinator for the School City of South Bend where he developed an outstanding program of related training for industrial apprentices in the South Bend area. In this capacity, Mr. Needler worked closely with training directors, foremen, journeymen, and joint apprenticeship committees in the various craft areas.

At Studebaker, Mr. Needler will still be closely connected with the program that he helped to develop. He succeeds E. Warrick who retired in July. — *C. E. Highlen.*

♦ Lawrence T. Whalen, who taught auto service, and auto driver education in the West Allis School of Vocational and Adult Education, West Allis, Wis., died of a heart attack on September 9, 1953.

♦ Mortimer C. Ritter, founder and first president of the Central High School of Needle Trades, New York City, and first president of the Fashion Institute of Technology, New York City, died after a long illness.

♦ George I. Martin, assistant state director of vocational education of Georgia, since 1950, has now been made state director of vocational education.

♦ John C. Tranbarger, associate professor of industrial education at Indiana State Teachers College, recently retired after 30 years of service.

New Millers Falls "Dyno-Mite"® Power Bits with HIGH-SPEED STEEL blades

6 SIZES

3/8", 1/2", 5/8", 3/4", 7/8", 1"

Available separately or in sets of 6 or 4 sizes complete in handsome plastic rolls

All shanks fit 1/4" chucks

Depth of cut: 5 1/2"

In these new, No. 800 Series Bits, Millers Falls brings you all the advantages of *high-speed*, steel blades — yet at no advance in price over ordinary, tool-steel bits. Specially designed for use in 1/4" power drills, they cut fast and accurately in soft and hard woods — stay sharp up to 10 times longer, and even go through screws and wire nails without being damaged or dulled. They're easy to resharpen, too. Order a set from your supplier and see for yourself why these new "Dyno-Mite" Bits are without question the biggest values on the market today.

Millers Falls Company
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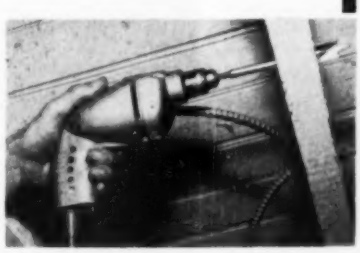

A PERFECT PAIR. Millers Falls powerful new No. 1814 1/4" Utility Drill and a new, high-speed "Dyno-Mite" Bit. Here, they bore a 1" hole quickly and easily through a hard fir joist.

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News Notes

NEW TECHNICAL BUILDING DEDICATED

The dedication exercises of the new Vocational-Technical Building were held at the Milwaukee Vocational and Adult Schools, Milwaukee, Wis., at 10:45 a.m., on November 17, 1953.

Otto A. Jirikowic, president of the Milwaukee Board of Vocational and Adult Education, and Honorable Frank P. Zeidler, mayor of the city of Milwaukee, welcomed those who attended the ceremonies.

Dr. William F. Rasche, director of the school, then spoke on the subject, "The Vision of the Founders," outlining the history of the pioneer work in vocational education performed in the state of Wisconsin and the city of Milwaukee.

Clarence L. Greiber, state director, Wisconsin Board of Vocational and Adult Education, then spoke on "Industry's Stake in Technical Education."

The new building was open for inspection before the dedication exercises, and again at an open house held in the evening.

Shops using heavy machinery, which were formerly located in the Central building, were moved to this new building. These shops include: automobile mechanics, aircraft engine mechanics, machine shop, foundry, welding, heat treating, diesel engines, and auto body and fender work.

At an informal luncheon at noon, Sieker Hall was formally named.

Mrs. Sieker and her two sons, William and George, were honored guests at the dedication of this hall which was named after William C. Sieker, the first principal of the school.

Mr. Sieker was principal from the opening of the school, then known as the Milwaukee Continuation School, until his death 17 years later.

♦ An enrollment of over 450 persons participated in classes, workshops, and conferences of The Stout Institute's 1953 summer session.

Students enrolled in a variety of courses in industrial education, home economics, and vocational education. In addition, a number of persons were working toward advanced degrees.

Dr. Joseph R. Strobel, assistant commissioner for vocational education of the U. S. Office of Education and a Stout Institute graduate of 1923; Arthur B. Mays, professor emeritus of industrial education at the University of Illinois; and Dr. Homer J. Smith, head of the industrial education department at the University of Minnesota, were educational consultants.

Dr. John L. Feirer, head of the industrial-arts department at Western Michigan College, taught several courses during the session.

♦ The new highway menace now is not the one-arm driver but rather *the one-finger driver* traveling at 70 miles an hour in a high-powered automobile equipped with power steering.

♦ Wayne University recently unveiled a giant new electric computer capable of carrying out in one day the calculation performed by a mathematician working two years with a desk calculator.

Housed in Wayne's Computation Laboratory, the machine known as UDEC for unitized digital electronic computer, was designed and built by the Burroughs Corporation in its Philadelphia laboratories. It will be used for the rapid solution of complex industrial and business problems and for training personnel in the electronic computer field.

♦ Electronic computing facilities available to help solve problems of business and industry at Armour Research Foundation of Illinois Institute of Technology, Chicago, are described in a new booklet published by the Foundation.

Copies of the brochure are available from the *Computer Center, Armour Research Foundation of Illinois Institute of Technology, Technology Center, Chicago 16, Ill.*

♦ When the three-year-old vocational agriculture department at Atkinson, Neb., had outgrown its temporary quarters, the school board purchased a Quonset hut from the low bidder at a net cost of $11,000. As part of the contract cost, the successful bidder set up the building. The balance was up to the vo-ag instructor, Laurence Lange, and his 50 boys, aided by institutional-on-farm veterans who poured the concrete floor.

Here was the deal: The boys were to line the hut interior, erect masonite hard board partitions, and do the painting as part of their classwork. The school board, of course, financed the project and provided the additional furnishings required to make the hut habitable for school purposes.

♦ Henry Puciato, Jr., of Hastings-on-Hudson, N. Y., High School became the first New York State student member of the Wise Owl Club of America. Henry saved his eyesight by wearing safety glasses while pouring a sinker mold in the school shop. When hot lead spattered toward his face hitting the right lens of his safety glasses leaving his eye untouched, he became eligible for membership in this exclusive club. The Wise Owl Club idea originated in the American Car and Foundry Company's St. Louis plant. Today it is sponsored by the National Society for the Prevention of Blindness to encourage industrial workers and vocational school students to maintain high standards of eye safety on the job. Henry is the second high school student in the United States to become a member.

♦ The first motion picture ever produced that deals exclusively with the contract tool and die industry and its vital role in the American economy was premiered by the National Tool and Die Manufacturers Association in New York City on September 15.

The 16mm., twenty-minute, full-color and sound film, entitled *Tool and Die Making — Keystone of Mass Production*, was produced by Farrell & Gage Films, Inc., New York, under the supervision of the association's public relations counsel, Fred Wittner. Sequences were filmed at tool and die shops and leading production plants in the East and Midwest.

The film will be used by the association and its 800 member shops to encourage young men with mechanical aptitude to become tool and die apprentices.

After the film has been shown in all of the 23 tool centers of the *National Tool and Die Manufacturing Association* throughout the country, prints will be available for loan or purchase through the association's offices, *907 Public Square Building, Cleveland 13, Ohio.*

♦ Driver education in Augusta, Me., has borne fruit. Because of a well-arranged driver-education program, only 23 of 6303 pupils who have taken the course have been involved in auto accidents and none of the accidents resulted in fatalities.

♦ The Civil Aeronautics Authority has approved again this year the aircraft and engine mechanics' course at Western Michigan College, this being the only college in the state to have such a program approved.

Western Michigan is also continuing its flight training program, leading to a private pilot's license. After a lag in enrollments for several years, they have climbed back up to 21 students for the fall semester.

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New Publications

Automotive Service Volume II

By Ray F. Kuns. Cloth, 724 pp., 6¼ by 9⅛ in., illus., $6.50. The Bruce Publishing Co., 400 N. Broadway, Milwaukee 1, Wis.

This new edition is thoroughly revised and brought up to date by the author who has many years of teaching experience to his credit.

The material in this text has all been arranged according to the step-by-step method which has been accepted as the proper way in teaching automotive service.

Unit 1 of this text is on power plants, oiling, and cooling systems. Unit 2 covers engine repair and maintenance. Unit 3 discusses fuel systems — carburetors, fuel pumps, and gasoline lines, etc. Unit 4 discusses auto electricity.

The book is very thoroughly illustrated so that knowledge and skill can be obtained simultaneously.

The contents can be readily arranged so as to fit the needs of the student. The two volumes may be taken as the basis of a four-year course in auto mechanics, or several units may be taught per semester for a two-year, four-semester course.

How to Troubleshoot a TV Receiver

By J. Richard Johnson. Paper, 124 pp., 5¾ by 8⅛ in., illus., $1.80. John F. Rider Publisher, Inc., 480 Canal St., New York 13, N. Y.

This little text gives the beginner an opportunity to learn how to get the most out of TV service data; why it is advisable to divide the receiver into sections; what tools, equipment, and accessories will be needed by the TV troubleshooter and repairman; how to make the preliminary observations and checks; how to use test patterns and crosshatch patterns in troubleshooting; how to adjust the controls, check tubes, discover what is the cause of the dead receiver; how to interpret roster and picture distortion; and the causes of sound troubles.

Advanced Woodwork and Furniture Making

By John L. Feirer. Cloth, 400 pp., 6 by 9 in., illus., $3.96. Chas. A. Bennett Co. Inc., Peoria 3, Ill.

A very helpful book for the student and the homecrafter.

It is profusely illustrated and shows very clearly how to do the various hand and tool operations that the woodworker must perform in producing a good piece of furniture.

Section 1 of the book describes how to select, design, and plan a piece of furniture.

Section 2 explains the first steps in furniture construction.

Section 3 discusses the problems encountered in furniture making.

Section 4 explains the intricacies met in wood finishing.

Section 5 shows how to use power woodworking tools, such as the planer, circular saw, band saw, jig saw, jointer, drill press, shaper, mortisers, routers, sanders, and wood lathes. It also describes how to sharpen machine tools.

Section 6 presents 18 fine projects.

Transitors, Today and Tomorrow

Paper cover, 24-page booklet published by the Radio Corporation of America, RCA Bldg., 30 Rockefeller Plaza, New York 20, N. Y.

Transitors do work that is similar to that done by electron tubes. However, while the tubes control electrons in a vacuum, the transitor controls electrons in a solid — a carefully prepared germanium crystal.

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Incentives Used in Motivating Professional Growth of Teachers

Paper covered booklet by N. Durward Cory, prepared by the Committee on Teacher Education, Commission on Research and Service, North Central Association of Colleges and Secondary Schools.

A summary of a study which tried to ascertain incentives which motivate teachers to want to grow and develop.

Nuclear Physics

By W. Heisenberg. Cloth, 225 pp., 5 by 7½ in., illus., $4.75. Philosophical Library, Inc., 15 East 40th St., New York 16, N. Y.

This book attempts to make a profound subject less confusing, and presents in eight chapters the atomic theory, from antiquity to the end of the nineteenth century; the older notion of molecules and atoms; radioactivity and building blocks of the nucleus; the normal states of atomic nuclei; the nuclear forces; nuclear reactions; tools of nuclear physics; and practical applications of nuclear physics.

(Continued on page 28A)

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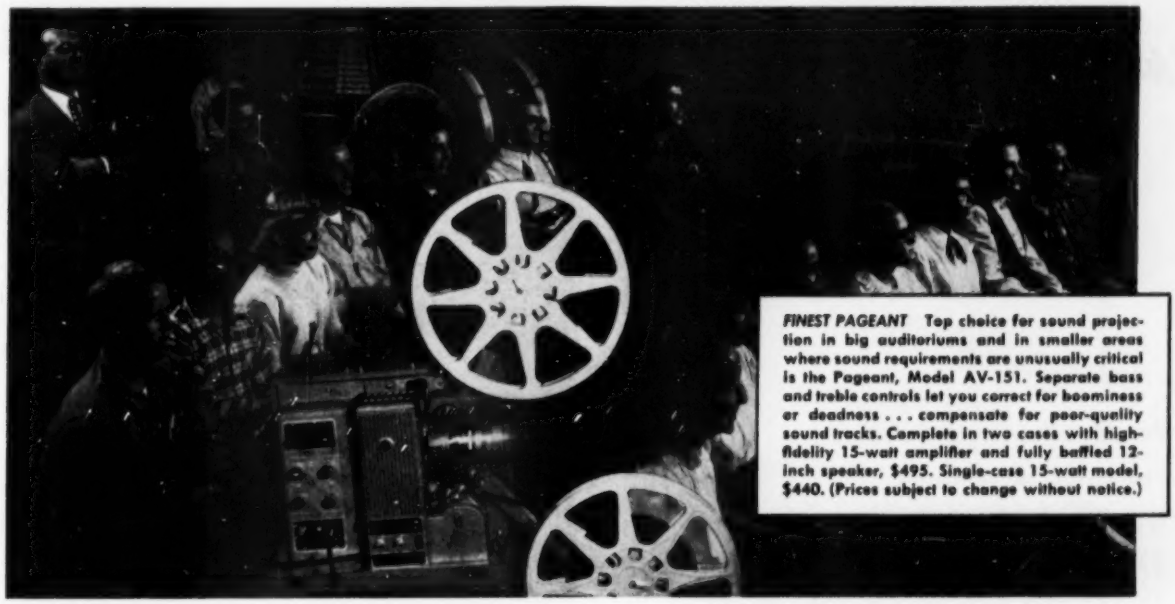

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Tampa, Florida

"Our experience has proven clearly that the pre-lubrication feature of the Kodascope Pageant Sound Projector is the logical answer to a good many of our service problems. We cannot recommend the Pageant Projector too highly."

Harold McLarey
Grimm-Williams Co.
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ASSOCIATION NEWS

(Continued from page 8A)

The discussion topics embraced the subjects of slides, film strips, motion pictures, charts, models, displays, photographs, and other methods.

Shriver L. Coover summarized the several addresses.

Awards for outstanding contributions to vocational education were presented to C. M. Miller, A. K. Getman, Dr. Homer J. Smith, and Edna Amidow.

Citations for outstanding aid and work in behalf of vocational education were given to Representative Graham Barden, North Carolina, and Senator Walter F. George, Georgia.

At the house of delegates meeting on Friday afternoon the following officers were elected for the coming year: president, Mark Nichols, Salt Lake City, Utah; treasurer, Charles W. Sylvester, Baltimore, Md.; executive secretary, M. D. Mobley, Washington, D. C.; vice-presidents: Cecil Stanley (distributive education), Lincoln, Neb.; Dr. Shriver L. Coover (industrial arts), California, Pa.; R. D. Anderson (agricultural education), Columbia, S. C.; Louise Keller (home economics education), Des Moines, Iowa.

The Ship's program, held at 10:00 a.m., Friday, was the usual big success.

The Ship represents the dealers and manufacturers who exhibited at the convention. There were 145 separate exhibits, an all-time high up till now.

The Ship's officers for 1954–55 are: captain, John Guthrie, Weber Costello Co., Chicago Heights, Ill.; first mate, Robert E. Stucker, Hardwood Corporation of America, Asheville, N. C.; second mate, William B. Jennison, School Arts Magazine, Worcester, Mass.; log officer, Harry Masters, L. S. Starrett Co., Athol, Mass.;

(Continued on page 28A)

THE SHIP PAYS TRIBUTE TO

M. D. Mobley

M. D. Mobley, Distinguished Son of Georgia:

In recognition of your Outstanding Service and Leadership in Education, we of THE SHIP salute you.

As Teacher, Supervisor, State Director, Writer, Editor, Consultant and Sponsor of Future Farmers of America you have contributed greatly to the improvement of educational opportunities.

In your Civic and Educational Leadership in Local, State, National and International Affairs you are constantly working for the best interest of all education to build and strengthen our American Way of Life, and it is an inspiration to all who come under your influence.

M. D. Mobley, Executive Secretary of the American Vocational Association, we of THE SHIP are pleased and honored by this opportunity to recognize publicly your distinguished service to mankind.

Given under our hand and seal this Twenty-Seventh Day of November, One Thousand Nine Hundred and Fifty-Three, A.D., at the Forty-Seventh Annual Convention of the American Vocational Association in Chicago, Illinois.

THE SHIP

A moral organization of representatives of firms in the field of vocational education.

John S. Guthrie, CAPTAIN
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Chas. W. Sylvester, PURSER

Harry W. Sears
Charles A. Roper
Paul V. VanKlinefelt
Vernon Parson
R. C. Stucker
Kenyon S. Fletcher, COMMITTEE ON RECOGNITION OF VALIANT SERVICE

M. D. Mobley, Executive Secretary of the American Vocational Association, receives Ship's Citation

Trade and Industrial Education Meetings

The National Association of State Supervisors of Trade and Industrial Education, and the National Association of Industrial Teacher Educators held many meetings to discuss their problems and work out solutions for them.

The vocational guidance group in their meetings discussed the "Consultative Services to States," "Present and Future Status of Guidance Services on Federal, State, and Local Levels," "Group Procedures in Providing Guidance Information to Pupils," "Practical Applications of Counseling Procedures," and "The Place of Guidance Services in Vocational, Agricultural, and Homemaking Education."

The distributive education group in their meetings discussed club activities, establishment and maintenance of high standards in the years ahead, correlating co-operative part-time in-class instruction with on-the-job training, and the evaluating of distributive education programs for further improvements.

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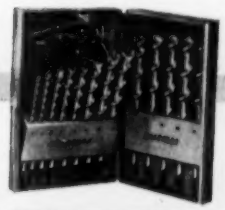
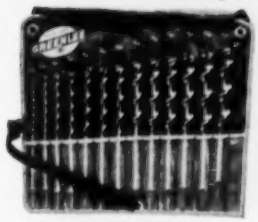
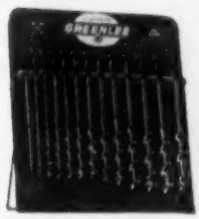


Set of 13 bits in steel box. Hang up or stand on shop bench.



Sets of 6, 8, 9 or 13 bits in plastic roll. Grommets for hanging up.



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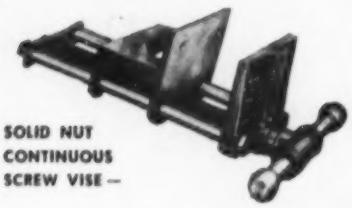

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ASSOCIATION NEWS

(Continued from page 26A)

purser, Paul Van Winkle, The Chas. A. Bennett Co., Peoria, Ill.; radio officer, C. H. Clawson, Brodhead-Garrett Co., Cleveland, Ohio; steward, T. C. Linacre, E. H. Sheldon Equipment Co., Muskegon, Mich.

The Ship's citation for outstanding service to industrial arts and vocational education for 1953 was awarded to Dr. M. D. Mobley, executive secretary of the American Vocational Association.

The 1954 AVA convention will be held on December 3 to 7, at San Francisco. In 1955 the convention will go to Atlantic City, and the dates are November 28 to December 3. The city chosen for the 1956 convention is St. Louis, and the dates are December 3 to 7.

NEW PUBLICATIONS

(Continued from page 24A)

Statistics of Land-Grant Colleges and Universities, Year Ended June 30, 1952

Prepared by Maude Farr and Robert C. Story. Office of Education Bulletin 1953, No. 1, 53 pp., 20 cents. For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

This publication continues the series of annual land-grant college reports which had their beginning with the establishment of the Office of Education in 1867.

The Federal-State relationship established in the land-grant colleges has brought benefits to all the parties of interest: the colleges, the states, the Federal Government, and the nation.

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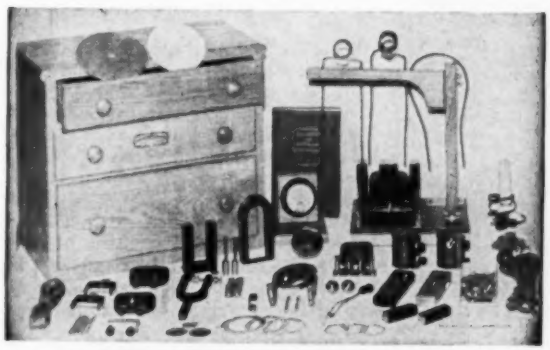

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McKnight Publications

"TEACHING SUCCESSFULLY THE INDUSTRIAL ARTS & VOCATIONAL SUBJECTS"

By G. Harold Silvius & Estell H. Curry

New book, Fall, 1953

340 pages, 6 x 9. This book contains discussions and suggestions on such important phases of teaching as class organization, planning work, methods and techniques, safety, selection and use of teaching materials, student evaluation and community relations.

This is a book that every teacher of Industrial and Vocational Education will find helpful in his professional library. $4.50

"SELECTING AN OCCUPATION"

By C. A. Prosser & C. S. Sifferd

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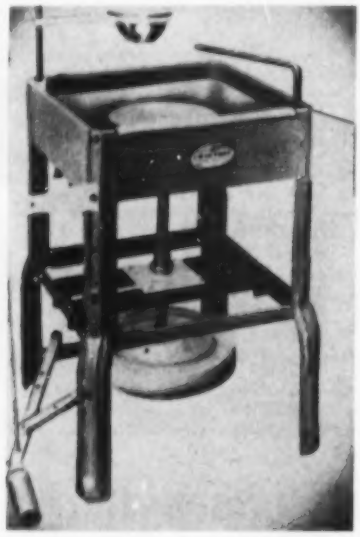
The new Craftool treadle wheel is designed for today's use in schools, occupational therapy shops, and ceramic studios.

The unit is adjustable in height. A 75-lb. balanced flywheel is mounted on a 1-in. shaft



New Craftool Treadle Wheel

and runs on two self-aligning ball bearings. The foot treadle can either be used for left or right action and has three speeds. The head is a heavy, cast aluminum, reversible type. A removable, plastic tray 20 by 20 by 4½ in., is furnished for easy cleaning. A natural drain also is provided.

The machine has a gray, baked enamel finish. Arm and side rests and water pot are supplied. All fittings are oxidized against rust.

For detailed specifications and catalog, write to *Craftools, Inc., 401 Broadway, New York 13, N. Y.*

(For Convenience Circle Index Code 0201)

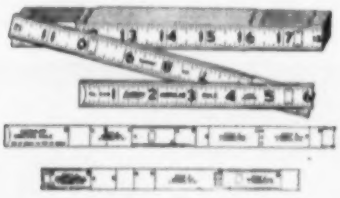
NEW LUFKIN MASON'S MODULAR SPACING RULE

A given-size modular brick is always laid the same number of courses in 16 in. with a specified joint thickness. One side of the No. 646 rule is marked with a 16-in. repeating series of numbers that show the vertical coursing for the following modular masonry units: concrete block and glass bricks, facing tile, economy brick and small facing tile, engineered brick, standard brick, and Roman brick. The first section is 4-in. long, which permits butting the rule on the first 16-in. module. As all other sections are an even 6 in. long, the Lufkin Mason's Modular Spacing Rule can also be used for spacing 6- and 12-in. glass blocks.

The other side of the No. 646 rule is marked consecutive inches to sixteenths on both edges.

This new rule is an addition to the Lufkin line of "Red End" folding wood rules, and has all of their superior construction features.

For further information write to *The Lufkin Rule Co., Saginaw, Mich.*



New Lufkin Mason's Modular Spacing Rule

(For Convenience Circle Index Code 0202)

ATLAS PRESS SAFETY POSTERS

Safety Sam — a shrewd *teacher* who gets safe shop practices across to students in a humorous light — is a series of posters being offered free to shop instructors by Atlas Press Company, Kalamazoo manufacturer of belt-driven power and machine tools.

The first 8½ by 11 in., 2-color poster is illustrated herewith. Five additional posters are scheduled for distribution during the balance of the school year.

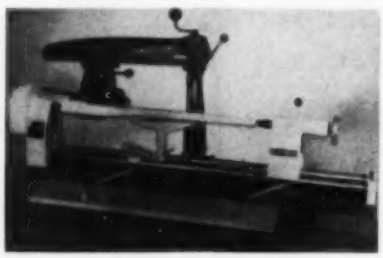
To receive the complete Safety Sam series, write to *Atlas Press Company, 1306 North Pitcher St., Kalamazoo, Mich.*, giving your name, school, and school address.

(For Convenience Circle Index Code 0203)

DeWALT'S NEW 12-IN. LATHE

A new lathe capable of turning stock up to 12 in. in diameter and 37 in. in length, has been put on the market by DeWalt, Inc., subsidiary of American Machine & Foundry Company.

While designed primarily as an attachment for the DeWalt Power Shop, the lathe can also be used as an independent workshop item, mounted on any workbench and powered by any type motor.



DeWalt's New Lathe

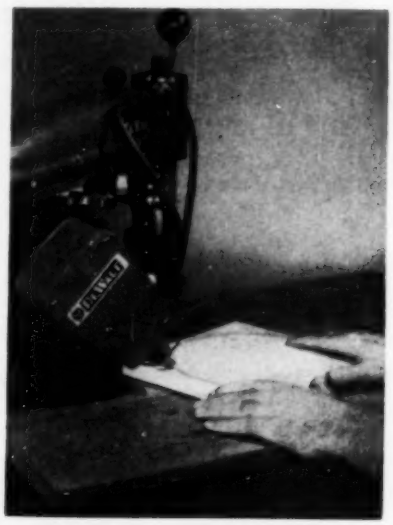
It is sturdily constructed, has a large capacity, and is low in cost.

In addition to standard turning operations on wood, DeWalt's new lathe can be used for faceplate turning and boring and for light metal spinning. All necessary accessories for these auxiliary operations are included in the basic purchase price.

This firm also is producing a saber saw attachment to its celebrated radial-arm power shop.

It is different from the conventionally designed jig and saber saw, and is mounted directly on the motor assembly of the DeWalt Power Shop.

One of the more unusual features of this saber saw is its ability to perform bevel scroll cutting without table-tilting adjustments. The entire tool can be tilted to any angle of bevel up to 45 deg., left or right, by adjusting a wing nut.



DeWalt's New Saber Saw

The saber saw unit is housed in a casting less than 9 by 6 in. in size. Despite the compact construction, it is capable of cutting both interior and exterior curves on stock up to 2 in. thick. Maximum throat capacity, from blade to column, is more than 27 in.

For further information about the new DeWalt Lathe and Saber Saw, write to *American Machine and Foundry Co., 511 Fifth Ave., New York 17, N. Y.*

(For Convenience Circle Index Code 0204)

STEEL DRAWERS FOR BENCHES AND MACHINE STANDS

The Industrial Bench and Equipment Manufacturing Company is offering a new assortment of specially made all steel drawers for attaching to either steel top or wood top benches and machine stands. These drawers are in four standard sizes — 18 by 16 by 5 in.; 18 by 22 by 5 in.; 18 by 22 by 8 in.; and 20 by 20 by 6 in. The single, double, and triple decker arrangements are designed to increase the utility and

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usefulness of benches, work stands, and machine stands.

The drawers are made of heavy gauge steel with a hem of triple thickness around the upper edge, and all joints are welded to produce a strong, durable drawer. The slideways are integral with the top and give the drawer a smooth free movement without cramping or binding. Handles are specially designed to provide a comfortable grip. Runners and screws are inside of drawer thus providing an absolute theft-proof unit when locked. Cylinder locks, padlock attachments, or trays may also be supplied.

For further information, address *The Industrial Bench and Equipment Mfg. Co., 98 South St., New Britain, Conn.*

(For Convenience Circle Index Code 0205)

SPECIAL SAW SHARPENER GRANTED PATENT

A unique unit for sharpening circular saws that attaches to the power table and permits the homecraftsman, farmer, or carpenter to sharpen circular saws with professional accuracy has just been granted a patent No. 2646697 by the U. S. Commissioner of Patents.

Patented Circular Saw Sharpening Unit

Called the quick-way saw sharpener, this unit has a special index plate that assures proper and uniform grinding of every tooth. Precision spaced holes on the index plate lock the saw blade into position for correct grinding. No special skill is needed.

This unit sharpens all types of circular saws, combination, miter, and planer up to 12 in. in

(Continued on next page)

★ BLUEPRINT READING FOR ELECTRICIANS

(This text deals with residential installation; commercial & industrial installation is being prepared for later publication.)

Here is new instructional material covering the needs of the electrician in interpreting residential blueprints. The content is organized in teachable units and includes Review Problems and Tests for each unit. A full set of blueprints of a modern ranch home provides for the application of every possible type of circuit and installation. This material is the first of Delmar's advanced series for specific building trades.

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SHOP EQUIPMENT NEWS

(Continued from page 31A)

diameter. It is furnished complete with the index plate, a special high speed grinding wheel, a saw blade holder, blade holder adapters, spacing bar, mounting plate, miter face block, and adjusting slots.

For further information write direct to the *Quick-Way Saw Co., 37 Riverside, Corning, N. Y.*

(For Convenience Circle Index Code 0206)

HIGGINS INK PEN CLEANER JAR

Higgins Ink Company have just released a straight-sided 6-oz. jar of Higgins Pen Cleaner equipped with a screw cap and containing a special plastic strainer in the bottom of the jar. Affixed to the center of the strainer is a rod which projects above the level of the liquid.

Higgins Ink Company
Pen Cleaner Jar

This rod enables the user to raise the strainer and remove small items such as Wrico and Leroy pen parts, airbrush parts, lettering pens, and drafting instruments that have been dropped into the jar for cleaning.

For further information about this ingenious device write to *Higgins Ink Co., Inc., 271 Ninth St., Brooklyn 15, N. Y.*

(For Convenience Circle Index Code 0207)

NEW GREENLEE ELECTRIC DRILL BITS, AND TUBULAR DOOR-LOCK BITS

A new line of bits specially designed for use in portable electric drills is now being made by Greenlee Tool Company.

Modeled after the regular Greenlee brace bit line, these new tools are designed to meet the general requirements of home craftsmen, carpenters, construction workers, and others.

These new Greenlee bits have fine-pitch screw points to compensate for high r.p.m. of electric drills and are completely heat-treated for extra strength. Shanks are accurately machined for precise alignment of the tool throughout.

They are available in wide size ranges in the following types: single-twist electric drill bits, solid-center electric drill bits, and ship-auger electric drill bits.

This firm also is manufacturing a set of special bits to handle practically every requirement for boring openings to accommodate all makes of tubular-type locks.

(Continued on page 34A)

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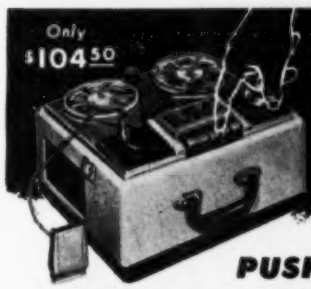

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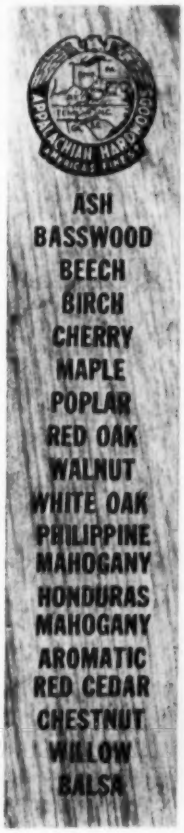

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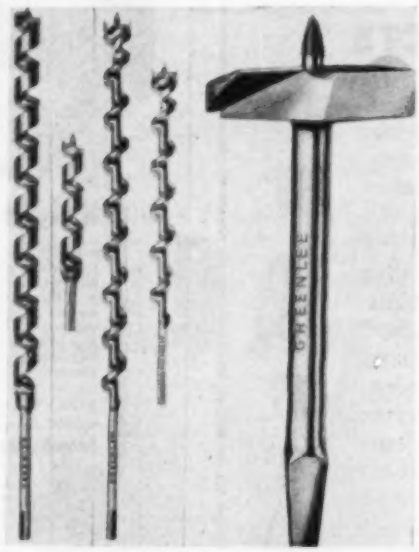
SHOP EQUIPMENT NEWS

(Continued from page 32A)



Greenlee Drill Bits and Tubular Door-Lock Bit

Called Greenlee No. 26 door lock bits, these tools are made in five sizes: 1⅝-, 1¾-, 1⅞-, 2-, and 2⅛-in. They feature a single-cutter head with a fine lead screw and one outlining spur for fast, smooth boring. Over-all length is 5½ in., and the shank is standard brace type.

These door lock bits are available either individually packed or in sets of all five sizes in a handy plastic roll.

For further information write to *Greenlee Tool Co., Rockford, Ill.*

(For Convenience Circle Index Code 0208)

SCREW-DRIVER WALL CHART

Snap-on Tools Corporation, Kenosha, Wis., has available, free of charge, to school shops a new 25 by 30 in. wall chart on screw drivers. Designed especially to aid shop instructors in teaching correct usage to their students, it also illustrates and describes all the various types of screw drivers that are in common use.

Other charts issued previously and still available cover socket wrenches, Boxockets, punches and chisels, and pullers. To receive your free copy of any or all of these charts, write to the Advertising Department, *Snap-on Tools Corp., Kenosha, Wis.*, on your school letterhead.

(For Convenience Circle Index Code 0209)

CINCINNATI PRESS BRAKE CATALOG B-4

The Cincinnati Shaper Company has just issued a 72-page catalog describing their line of press brakes.

It is excellently illustrated and shows how the press brakes can be used in numerous forming, corrugating, curving, notching, punching, shearing, and trimming operations.

The catalog contains illustrations showing many kinds of brake dies that are available.

To get your free copy of this catalog, write to *Cincinnati Shaper Co., Hopple, Garrard, and Elm Sts., Cincinnati 25, Ohio.*

(For Convenience Circle Index Code 0210)

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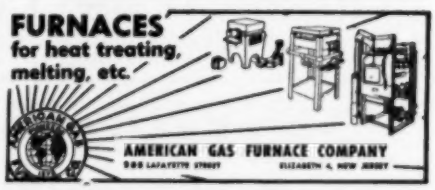

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21	Allied Radio Corp., The	33A
22	American Gas Furnace Co.	34A
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25	Atlas Press Company, The	7A
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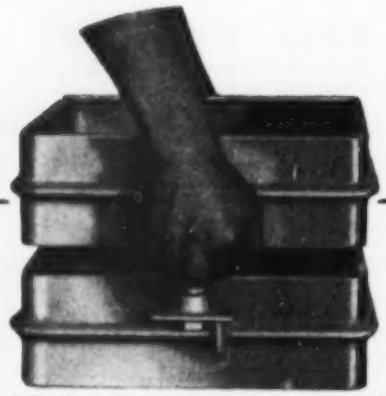

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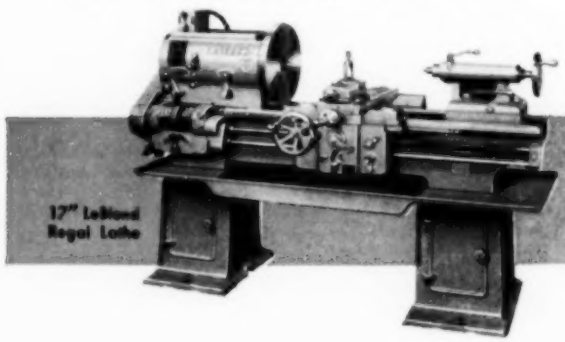

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